SANYO

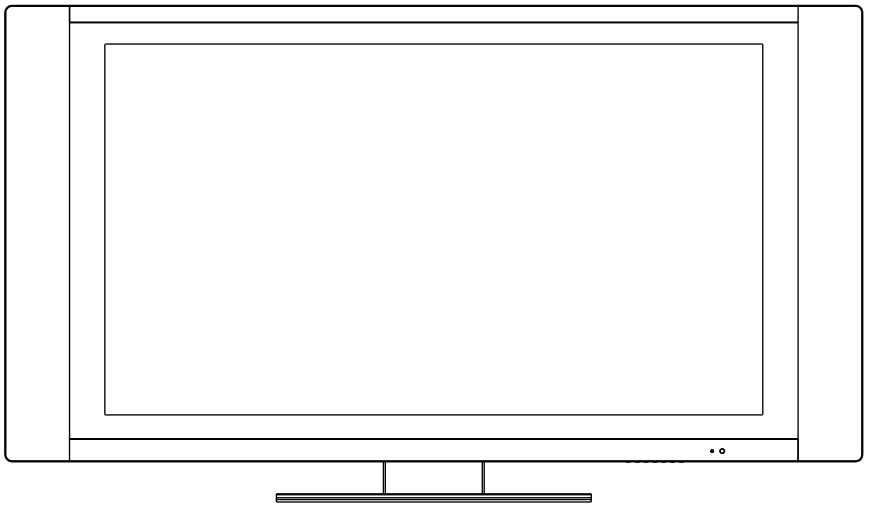
FILE NO.

SERVICE MANUAL

LCD TV

LCD-47XR2

PRODUCT CODE No.
1 682 342 81 : AUS, SS etc.
1 682 343 78 : INDIA



REFERENCE No.:SM0915013

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Attention: This service manual is only for service personnel to take reference with. Before servicing please read the following points carefully.

Safety precautions

1. Instructions

Be sure to switch off the power supply before replacing or welding any components or inserting/plugging in connection wire Anti static measures to be taken (throughout the entire production process!):

a) Do not touch here and there by hand at will;

b) Be sure to use anti static electric iron;

c) It's a must for the welder to wear anti static gloves.

Please refer to the detailed list before replacing components that have special safety requirements. Do not change the specs and type at will.

2. Points for attention in servicing of LCD

2.1 Screens are different from one model to another and therefore not interchangeable. Be sure to use the screen of the original model for replacement.

2.2 The operation voltage of LCD screen is 700-825V. Be sure to take proper measures in protecting yourself and the machine when testing the system in the course of normal operation or right after the power is switched off. Please do not touch the circuit or the metal part of the module that is in operation mode. Relevant operation is possible only one minute after the power is switched off.

2.3 Do not use any adapter that is not identical with the TV set. Otherwise it will cause fire or damage to the set.

2.4 Never operate the set or do any installation work in bad environment such as wet bathroom, laundry, kitchen, or nearby fire source, heating equipment and devices or exposure to sunlight etc. Otherwise bad effect will result.

2.5 If any foreign substance such as water, liquid, metal slices or other matters happens to fall into the module, be sure to cut the power off immediately and do not move anything on the module lest it should cause fire or electric shock due to contact with the high voltage or short circuit.

2.6 Should there be smoke, abnormal smell or sound from the module, please shut the power off at once. Likewise, if the screen is not working after the power is on or in the course of operation, the power must be cut off immediately and no more operation is allowed under the same condition.

2.7 Do not pull out or plug in the connection wire when the module is in operation or just after the power is off because in this case relatively high voltage still remains in the capacitor of the driving circuit. Please wait at least one minute before the pulling out or plugging in the connection wire.

2.8 When operating or installing LCD please don't subject the LCD components to bending, twisting or extrusion, collision lest mishap should result.

2.9 As most of the circuitry in LCD TV set is composed of CMOS integrated circuits, it's necessary to pay attention to anti statics. Before servicing LCD TV make sure to take anti static measure and ensure full grounding for all the parts that have to be grounded.

2.10 There are lots of connection wires between parts behind the LCD screen. When servicing or moving the set please take care not to touch or scratch them. Once they are damaged the screen

would be unable to work and no way to get it repaired.
If the connection wires, connectors or components fixed by the thermotropic glue need to disengage when service, please soak the thermotropic glue into the alhocol and then pull them out in case of damage.
2.11 Special care must be taken in transporting or handling it. Exquisite shock vibration may lead to breakage of screen glass or damage to driving circuit. Therefore it must be packed in a strong case before the transportation or handling.
2.12 For the storage make sure to put it in a place where the environment can be controlled so as to prevent the temperature and humidity from exceeding the limits as specified in the manual. For prolonged storage, it is necessary to house it in an anti-moisture bag and put them altogether in one place. The ambient conditions are tabulated as follows:

Temperature	Scope for operation	0 ~ +50 ^{o}C
	Scope for storage	-20 ~ +60 ^{o}C
Humidity	Scope for operation	20% ~ 85%
	Scope for storage	10% ~ 90%

2.13 Display of a fixed picture for a long time may result in appearance of picture residue on the screen, as commonly called “ghost shadow”. The extent of the residual picture varies with the maker of LCD screen. This phenomenon doesn’t represent failure. This “ghost shadow” may remain in the picture for a period of time (several minutes). But when operating it please avoid displaying still picture in high brightness for a long time.

3. Points for attention during installation

3.1 The front panel of LCD screen is of glass. When installing it please make sure to put it in place.
3.2 For service or installation it’s necessary to use specified screw lest it should damage the screen.
3.3 Be sure to take anti dust measures. Any foreign substance that happens to fall down between the screen and the glass will affect the receiving and viewing effect
3.4 When dismantling or mounting the protective partition plate that is used for anti vibration and insulation please take care to keep it in intactness so as to avoid hidden trouble.
3.5 Be sure to protect the cabinet from damage or scratch during service, dismantling or mounting.

Alignment instructions (LC-37T25& LC-42T17&LC-47T17)

1. Test equipment

Digital multimeter, signal generator (54200)

VG849 (HDMI signal generator)

CA210 (White balancer)

2. The alignment flow chart (see below Fig.1)

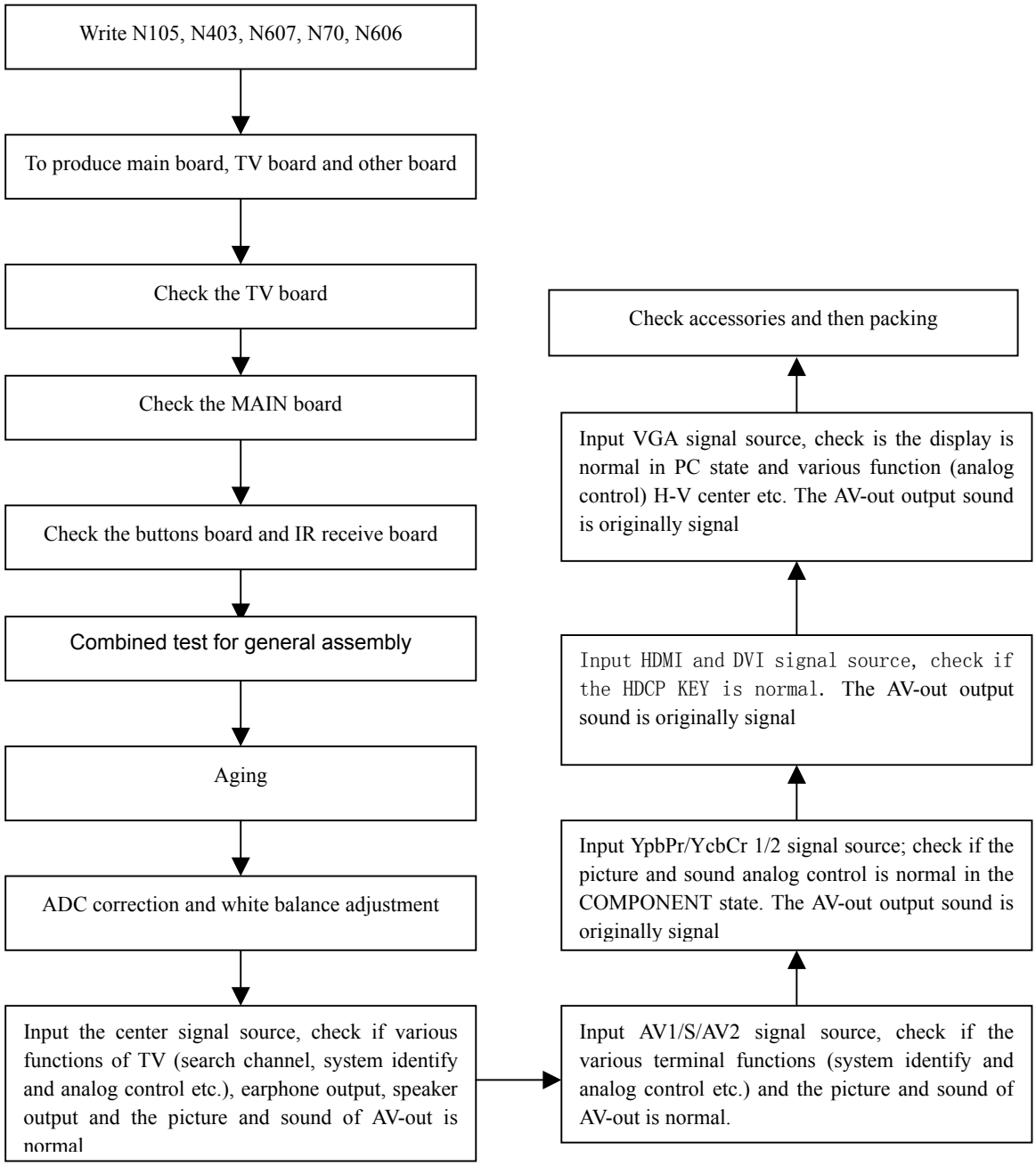

Write N105, N403, N607, N70, N606
To produce main board, TV board and other board
Check the TV board
Check the MAIN board
Check the buttons board and IR receive board
Combined test for general assembly
Aging
ADC correction and white balance adjustment
Input the center signal source, check if various functions of TV (search channel, system identify and analog control etc.), earphone output, speaker output and the picture and sound of AV-out is normal
Input AV1/S/AV2 signal source, check if the various terminal functions (system identify and analog control etc.) and the picture and sound of AV-out is normal.
Input YpbPr/YcbCr 1/2 signal source; check if the picture and sound analog control is normal in the COMPONENT state. The AV-out output sound is originally signal
Input HDMI and DVI signal source, check if the HDCP KEY is normal. The AV-out output sound is originally signal
Input VGA signal source, check is the display is normal in PC state and various function (analog control) H-V center etc. The AV-out output sound is originally signal
Check accessories and then packing

Fig.1 Flow process of alignment

3. Alignment instructions

3.1 the main board adjustment

a. Connect the X602 of main board to the infrared receive board, the supply power plug to X1, then

the indicator of the infrared receive board is red light.

b. Press the POWER button; the indicator change to blue light, the LED1 of main board is flicker of slow.
c. Write program to N102
d. Check if various channels are normal.

3.2 The TV board adjustment

a. Connect the high frequency board to main board, and connect the X501 and X502 to the supply power.
b. Press the POWER button, the indicator change to blue light.
c. Check if the picture and sound of TV/AV1/AV2/S/YPBPR1/TPBPR2 and sound of HDMI/VGA channels are normal. Check the STEREO and SAP. Check the picture and sound of the TV/AV1/S/AV2.

3.3 the unit adjustment

After install the unit, check it is normal working.

3.4 Aging

a. Select the TV channel, the screen is noise wave of no signal TV
b. Aging an hour.

3.5 ADC correction and white balance adjustment (use white balancer CA210 and signal generator VG849)

Enter the factory menu method: press “1”→ “9” → “7” → “9” button in the window menu state.

Note: warm color temperature coordinate (285, 294); warm color temperature coordinate (284, 299). LC-42T17, LC-47T17 and LC37T25/T7 cool color temperature coordinate (270, 283).

3.5.1 HDMI channel

a. Input 8 level gray signal 720p/60Hz.
b. Brightness to 50, contrast to 50.
c. Color temperature to warm.
d. Enter color temperature setup menu.
e. Adjust RED GAIN, GREEN GAIN, BLUE GAIN, until the fifth level color coordinate (270, 283).

3.5.2 D-SUB channel

a. Input the 16 level gray signal 1027 x 768 @ 60(TIMING: 889, PATTERN: 921)
b. Brightness to 50, contrast to 50.
c. Enter the ADC auto correction
d. Color temperature to warm.
e. Enter the color temperature setup menu.
f. Input the 8 level gray signal 1027 x 768 @ 60(TIMING: 889, PATTERN: 920)
g. Adjust the RED OFFSET, GREEN OFFSET, BLUE OFFSET, until the third level color coordinate (284, 299).
h. Adjust the RED GAIN, GREEN GAIN, BLUE GAIN, until the seventh level color coordinate (284, 299).
i. Repeat the g and h step, until the third and the seventh level color coordinate (284, 299).
j. Color temperature to cool.
k. Enter the color temperature setup menu.
l. Adjust the RED OFFSET, GREEN OFFSET, BLUE OFFSET, until the third level color coordinate (270, 283).
m. Adjust the RED GAIN, GREEN GAIN, BLUE GAIN, until the seventh level color coordinate (270,

283).

n. Repeat the L and M step, until the third and the seventh level color coordinate (270, 283).

3.5.3 high definition channel

a. Input the 720P SMPTE COLOR BAR signal (TIMING: 976, PATTERN: 984).
b. Brightness to 50, contrast to 50.
c. Enter the ADC auto correction.
d. Color temperature to warm.
e. Enter the color temperature setup menu.
f. Input the 8 level gray signal 720b/60Hz(TIMING: 976, PATTERN: 920).
g. Adjust the RED OFFSET, GREEN OFFSET, BLUE OFFSET, until the fourth level color coordinate (284, 299).
h. Adjust the RED GAIN, GREEN GAIN, BLUE GAIN, until the seventh level color coordinate (284, 299).
i. Repeat the g and h step, until the fourth and the seventh level color coordinate (284, 299).
j. Color temperature to cool.
k. Enter the color temperature setup menu.
l. Adjust the RED OFFSET, GREEN OFFSET, BLUE OFFSET, until the fourth level color coordinate (270, 283).
m. Adjust the RED GAIN, GREEN GAIN, BLUE GAIN, until the seventh level color coordinate (270, 283).
n. Repeat the l and m step, until the fourth and the seventh level color coordinate (270, 283).
o. Holding the pattern signal, change the timing signal, repeat the G to the M step for 480i, 480p, and 1080i signal.

3.5.4 the VIDEO channel

a. Input the eight level gray signal of PAL
b. Brightness to 50, contrast to 50.
c. Enter the factory menu.
d. Color temperature to warm.
e. Enter the color temperature setup menu.
f. Adjust the RED OFFSET, GREEN OFFSET, BLUE OFFSET, until the fourth level color coordinate (284, 299).
g. Adjust the RED GAIN, GREEN GAIN, BLUE GAIN, until the seventh level color coordinate (284, 299).
h. Repeat the f and g step, until the fourth and the seventh level color coordinate (284, 299).
i. Color temperature to cool.
j. Adjust the RED OFFSET, GREEN OFFSET, BLUE OFFSET, until the fourth level color coordinate (270, 283).
k. Adjust the RED GAIN, GREEN GAIN, BLUE GAIN, until the seventh level color coordinate (270, 283).
l. Repeat the j and k step, until the fourth and the seventh level color coordinate (270, 283).

3.5.5 the RF channel

a. Input the center signal source, set to D-8 channel
b. Brightness to 50, contrast to 50.
c. Enter the factory menu.
d. Color temperature to warm.

e. Enter the color temperature setup menu.
f. Adjust the RED OFFSET, GREEN OFFSET, BLUE OFFSET, until the third level color coordinate (284, 299).
g. Adjust the RED GAIN, GREEN GAIN, BLUE GAIN, until the seventh level color coordinate (284, 299).
h. Repeat the f and g step, until the third and the seventh level color coordinate (284, 299).
i. Color temperature to cool.
j. Adjust the RED OFFSET, GREEN OFFSET, BLUE OFFSET, until the third level color coordinate (270, 283).
k. Adjust the RED GAIN, GREEN GAIN, BLUE GAIN, until the seventh level color coordinate (270, 283).
l. Repeat the j and k step, until the third and the seventh level color coordinate (270, 283).

4 Performance check

4.1 TV terminal

Input the center signal source to RF terminal, enter searching menu → auto search, check if the leak channel, half-auto search channel, fine tune, earphone and speaker are normal. Check the AV OUT.

4.2 AV1/S/AV2 input terminals

Input AV1/S/AV2 signal source, check the picture and sound.

4.3 VGA terminal

Input the VGA signal (K7253 signal generator), separate input VGA format signal of table 1, check the picture and sound

Table1 PC display format signal

No.	Resolution	H-frequency(kHz)	V-frequency(Hz)	pixel clock pulse frequency(MHz)	remark
1	720 x 400	31.47	70.08	25.17	DOS
2	640 x 480	31.50	60.00	25.18	DOS
3	640 x 480	37.90	72.00	31.50	Mac.(SOG)
4	640 x 480	37.50	75.00	31.50	VESA
5	640 x 480	43.30	85.00	36.00	VESA
6	800 x 600	35.16	56.25	36.00	VESA
7	800 x 600	37.90	60.00	40.00	VESA
8	800 x 600	46.90	75.00	49.50	VESA
9	800 x 600	48.08	72.19	50.00	VESA
10	832 x 624	49.00	74.00	57.27	Mac.(H+V)
11	1024 x 768	48.40	60.00	65.00	VESA
12	1024 x 768	56.50	70.00	75.00	VESA
13	1024 x 768	60.00	75.00	78.75	VESA
14	1280 x 1024	64.00	60	108.00	SXGA
15	1280 x 1024	80.00	75	135.00	SXGA
16	1600 x 1200	75.00	60	162.00	UXGA

4.4 YPbPr terminal

Input the YPbPr signal source (K7253 signal generator), separate input format signal in table of

table 2, check the picture and sound.

Table 2 Component format signal

No.	H-frequency(kHz)	V-frequency(Hz)	signal
1	15.735	60	SDTV 480i
2	15.625	50	SDTV 576i
3	31.47	60	SDTV 483p
4	45.00	60	HDTV 720p
5	33.75	60	HDTV 1080i
6	28.13	50	HDTV 1080i
7	67.50	60	HDTV 1080p
8	56.25	50	HDTV 1080p

4.5 HDMI terminal

Input the DHMI signal source (VG849 signal generator), separate input format signal in table of table 3, check the picture and sound.

Table 3 HDMI format signal

No.	H-frequency(kHz)	V-frequency(Hz)	signal
1	15.735	60	SDTV 480i
2	15.625	50	SDTV 576i
3	31.47	60	SDTV 483p
4	45.00	60	HDTV 720p
5	33.75	60	HDTV 1080i
6	28.13	50	HDTV 1080i

HDMI format signal of audio

channel	2
sampling rate	support 32Kbit/s 44.1Kbit/s 48Kbit/s
bit wide	support 16bit,20bit,24bit

Method of software upgrading

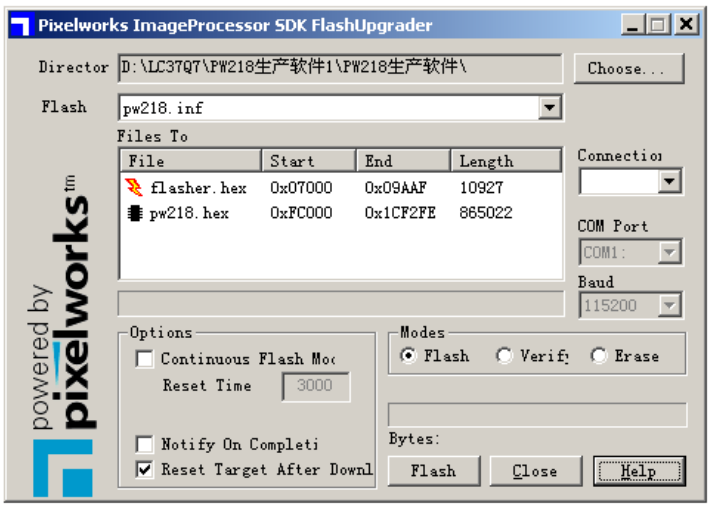
Steps of software upgrading are as follows:

1. Select a serial connection wire and a VGA connection wire and then connect them by means of a patch panel;

2. Use a serial wire to connect the PC to the patch panel and set TV set to off state;

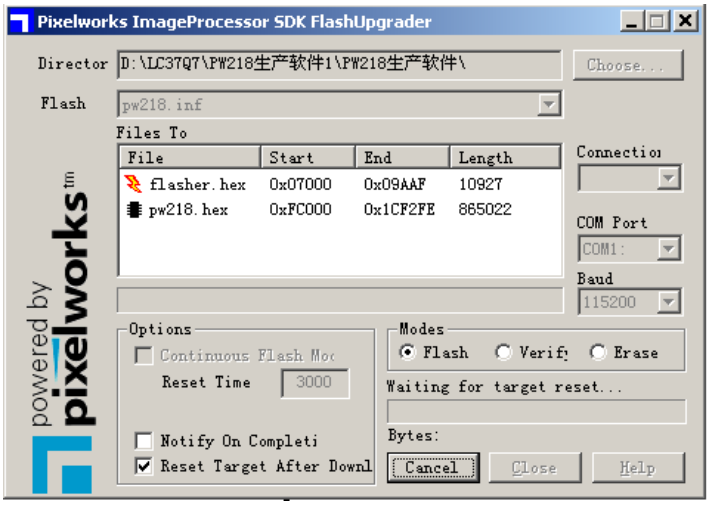
Open the software upgrade file holder and double click FlashUpgrader.exe (window 2000/XP/NT)

The following interfaces will show up after running the program:



Based on the computer features, set up the serial port (COM Port). Select corresponding serial port (if it's unable to FLASH WRITE, change to another port). Baud is selected to be 115200. Then select Reset Target After Download. Click FLASH pushbutton, it's ready to run. For other settings, please refer to the Fig. Above (already defaulted by the system, normally no need to change).

Switch on TV set the FLASH write program begins to run;



When the upgrading is complete, a window (below) will be opened. Press "Finish" button to complete the process.

Note: Do not shut the power off or turn the TV set on during the FLASH write. Otherwise it may lead to no way for flash to rewrite.

Working principle analysis of the unit

The unit has two MCU, the main MCU is PW218 (N601): it is used to control all the chips' working status on the main board (including image processing, channel switch, sound processing, image display etc.), sub CPU, OSD, searching channels, image effect adjustment, buttons control, infrared remote control etc.; the sub CPU is ATMEGA8L (N606): it is used to control power supply, including standby and turning on the unit by using remote control etc.. The two MCU correlates with each other through pin 14 INT (interruption) of ATMEGA8L, pin 28 and 29 SDA, SCL.

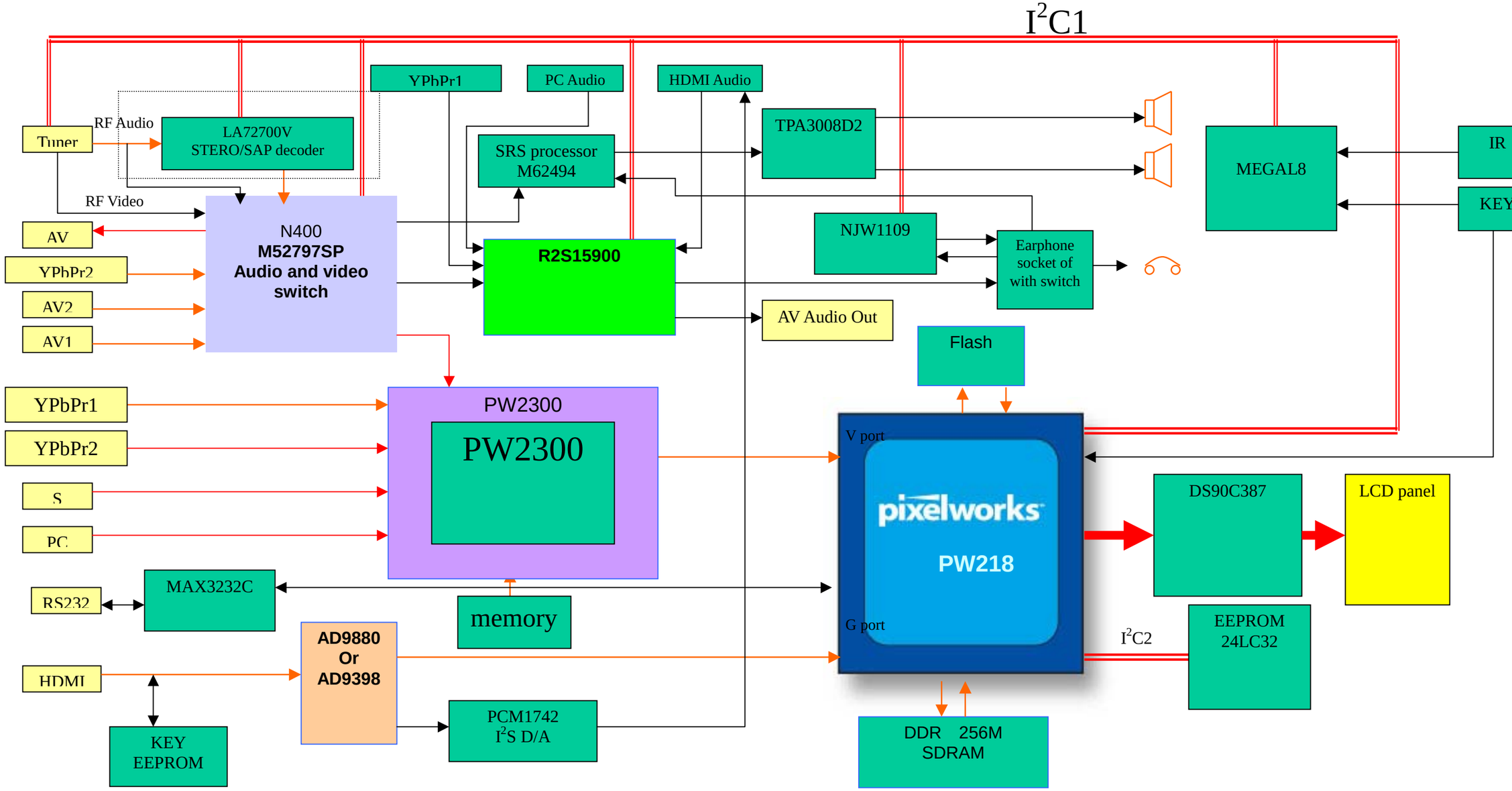
The unit has one integrative tuner (including HF and IF amp. circuits). The signal received by antenna is sent to tuner, under the control of MCU PW218 (N601) SDA and SCL, proper channel selection and right system switching will be done by the tuner, then video signal and audio signal will be output by the tuner through decoding and by high and intermediate amplification. Video signal of the tuner will then be sent to Decoder PW2300 (N201). Audio signal of the tuner will then be sent to AV switch box M52797 (N400), the audio signal of AV1, AV2 and HD2 of the main board will also be sent to M52797 (N400) at the same time. The selected audio signal after switching will be sent to R2S15900 (N301), and then switching selection will be done towards the above audio signal together with the audio signal of VGA, HDMI and HD1. The two chips are controlled by PW218 (N601), after the above process the finally selected way will be set to X300 earphone socket after under the control of volume, treble and bass which is finished by R2S15900 (N301), the earphone socket has the switching function, when earphone is plugged, sound will be sent to earphone amplifier NJW1109 (N302), then sent back to earphone socket after power amplification. If earphone is unplugged, sound will be sent to sound amplifier TPA3008 to do amplification and then sent to speaker.

Image parts:

Video signal of the tuner will be sent to AV switch box M52797 (N400), video signal of AV1 and AV2 will also be sent to M52797 (N400) at the same time, two groups of video output will be obtained after switching, one group of video output together with its audio output will be sent to AV_OUT terminal to treat as AV OUT. The other group of video output together with other video signals such as S-VIDEO, YpbPr1, YpbPr2 and VGA will be sent to PW2300 to do video decoding or AD transformation, then output 24bit digital RGB signal and some corresponding synchronous signals. Items such as 3D comb filter, channel switching, 5 lines Y/C separation and color decoding etc. are primarily done by PW2300. 24bit digital RGB signal and some corresponding synchronous signals outputted by PW2300 will then be sent to PW218 (N601). HDMI signal will also be sent to AD9398 (N101) to de decoding and output 24bit digital RGB signal as well as some corresponding synchronous signal, which will be sent to PW218 (N601). PW218 is a new generation chip of Pixelworks, which has ability to deal with images, 24bit digital RGB signal and some corresponding synchronous signals outputted by AD9398 and PW2300 will be sent to this chip to deal with images. The chip has functions such as converting from interleaved into line-by-line and image enhancement etc.. PW218 has SCALER function which can do format conversion towards different input formats so as to meet the format needs of the screen and finally output 24bit RGB signal. The interface standard of PDP screen is generally LVDS (low voltage differential signal), so the digital RGB signal outputted from PW218 is needed to send to converting interface chip N6 DS90C387 of LVDS to obtain LVDS signal, then it will be sent to the screen. PW218 is also the main CPU, its programs are stored in periphery device flash N701, and software upgrade through RS-232 interface is virtually upgrading the stored programs through PW218 towards N701.

Chief functions:
High definition 1080P LCD
16:9 wide screen
Support several kinds of HDTV wide voltage range, low standby power consumption (less than 1W)
One group of D-SUB, S-VSH (Y/C), RS232, AVOUT, HEADPHONE, HDMI, two groups of YPbPr/YCbCr, AV.

Block diagram

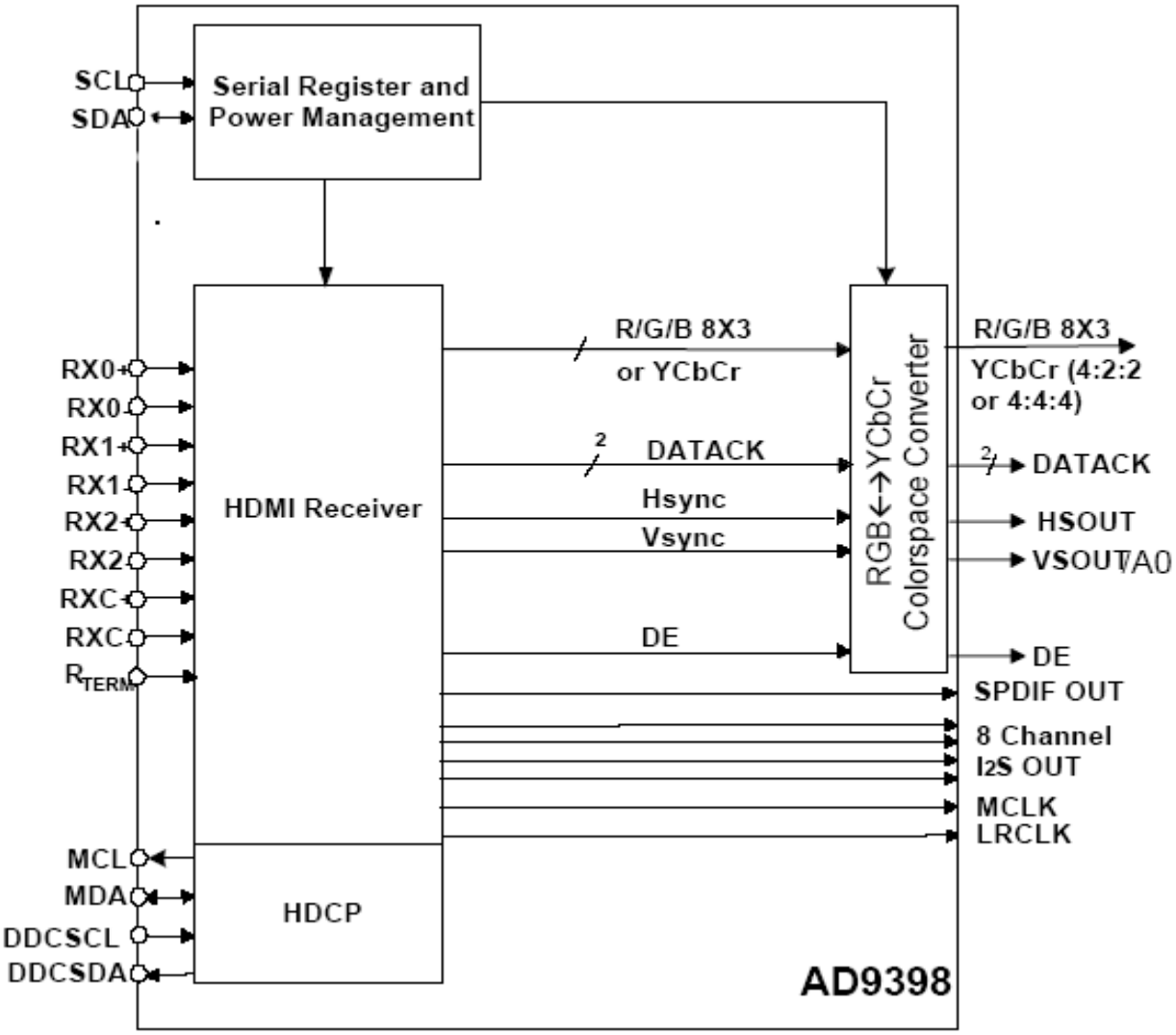


IC block diagram

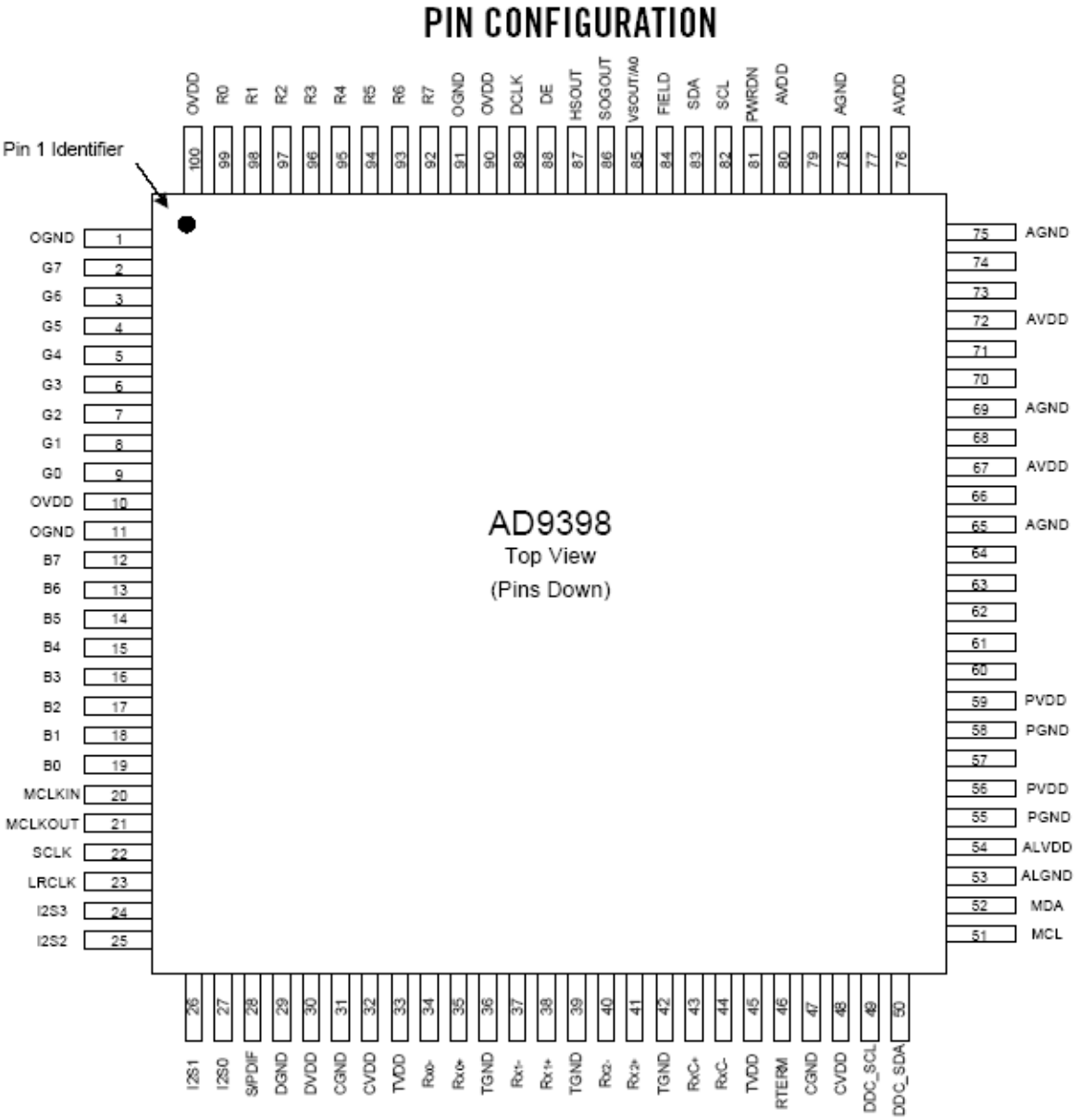
1. AD9880 and AD9398

AD9880 have HDMI digital and analog terminal of working frequency 165Hz, it support 1080P (non-interlaced scanning) and UXGA (1600 x 1200/60Hz) video format, also it support eight audio channel of 192KHz. AD9398 without analog terminal.

Internal Block Diagram



PIN configuration



AD9880 (AD9398) PINS FUNCTIONS

Pin	Name	Function	Pin	Name	Function
2-9	GGE(0-7)	Converter output	44	RXC+	DVI input
12-19	GBE(0-7)	Converter output	49	DDC_CLK	HDCP Slave Serial Port Data Clock
92-99	GRE(0-7)	Converter output	50	DDC_DATA	HDCP Slave Serial Port Data I/O
20, 21	MCLK	Control clock output	51	MCL	HDCP Master Serial Port Data Clock
22	I2S_SCK	Audio serial clock output	52	MDA	HDCP Master Serial Port Data I/O
23	I2S_WS	Bus clock data output	82	SCL-1	Serial Port Data Clock

27	I2S_SD	Bus audio data output	83	SDA_1	Serial Port Data I/O
34	RX0-	DVI input	84	G_FIEL0	Odd/Even Field Output
35	RX0+	DVI input	85	G_VS	VSYNC Output Clock
37	RX1-	DVI input	86	G_VHS	Sync on Green Slicer Output
38	RX1+	DVI input	87	G_HS	HSYNC Output Clock
40	RX2-	DVI input	88	G_DE	Data Enable
41	RX2+	DVI input	89	G_CLK	Data Output Clock
43	RXC-	DVI input			

2. PW2300

PW2300 is front processing signal of integration highly performance, multi-system, 3D video decoder and three highly velocity AD converter chip. It supports HDTV, NTSC, PAL and SECAM. Its analog port support 1080P(150MHz).

Internal Block Diagram

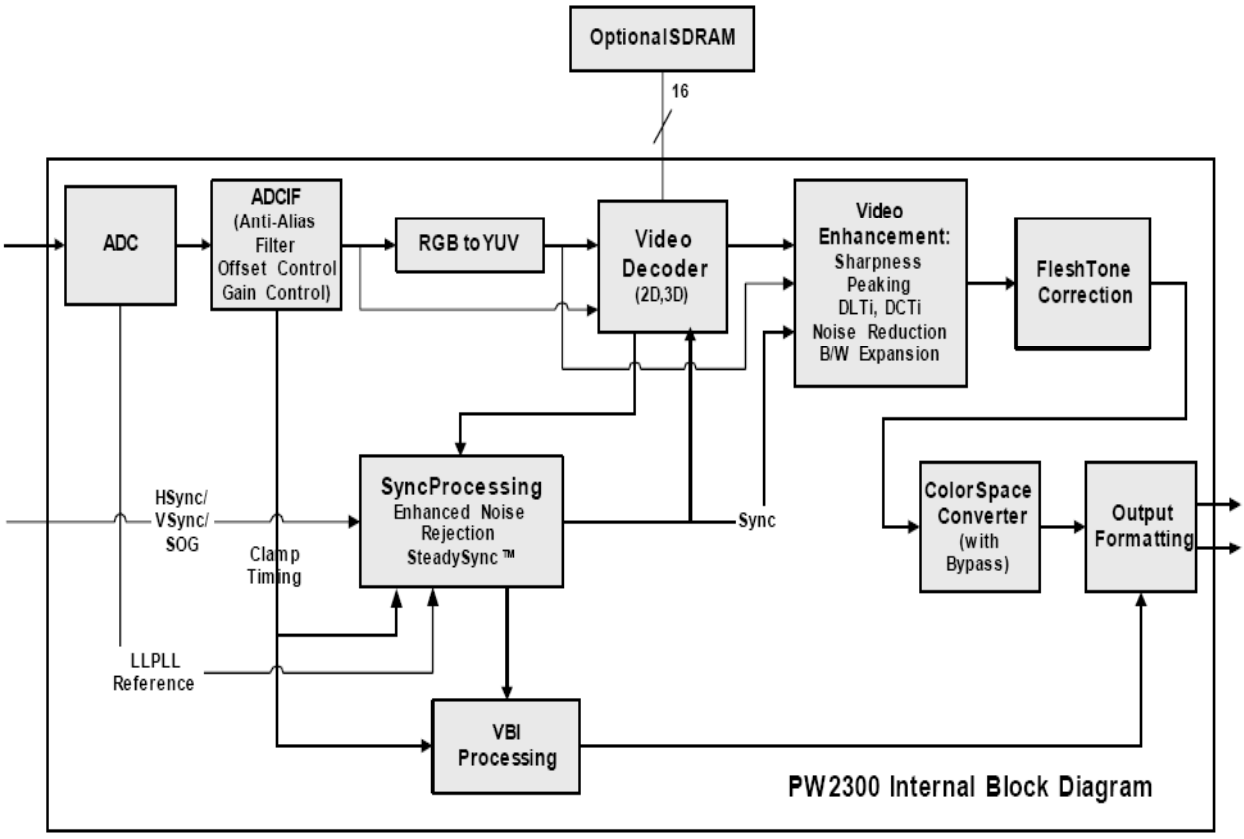


Figure 4-1 Internal Block Diagram

PW2300 PINS FUNCTION

Pin	Name	Function	Pin	Name	Function
A4	XIN	Resonator input	P1	R_2	AV2 red input
A5	XOUT	Resonator input	P2	B_2	AV2 greed input
B2	SDA	I2C bus data	P3	SOG_2	AV2 greed sync input

B3	SCL	I2Cbus clock	P4	G_2	AV2 blue input
K2	VGA-R1	VGA(red)	R1	CVBS_1	TV composite video signal input
K1	VGA-G1	VGA(greed)	R2	Y_1	S-VHS brightness signal input
L1	VGA-SOG1	VGA(greed sync signal)	R3	CVBS_SOG1	TV composite video signal greed sync input
M1	VGA-B1	VGA(blue)	R4	C_1	S-VHS chrominance signal input
T1	VGA_H	VGA(H-sync signal)	B9	GVBI	Vertical blanking blank
T3	VGA_V	VGA(V-sync signal)	E16	G_VS	V-SYNC output
N1	R_1	AV1 red input	F14	G_HS	H-SYNC output
N1	G_1	AV1 greed input	F15	G_AHS	H-SYNC of non-processing
N3	SOG_1	AV1 greed sync input	G15	G_DLK	Clock output
N4	B_1	AV1 blue input		GBE(0-7)	blue even pixel data output
	GBO(2-9)	Blue odd pixel data output		GGE(0-7)	greed even pixel data output
	GGO(2-9)	greed odd pixel data output		GRE(0-7)	red even pixel data output
	GRO(2-9)	red odd pixel data output			

3. PW218

PWE218 is highly quality SOC picture processing chip, it contain Scaling and Deinterlacing functions.

Internal Block Diagram

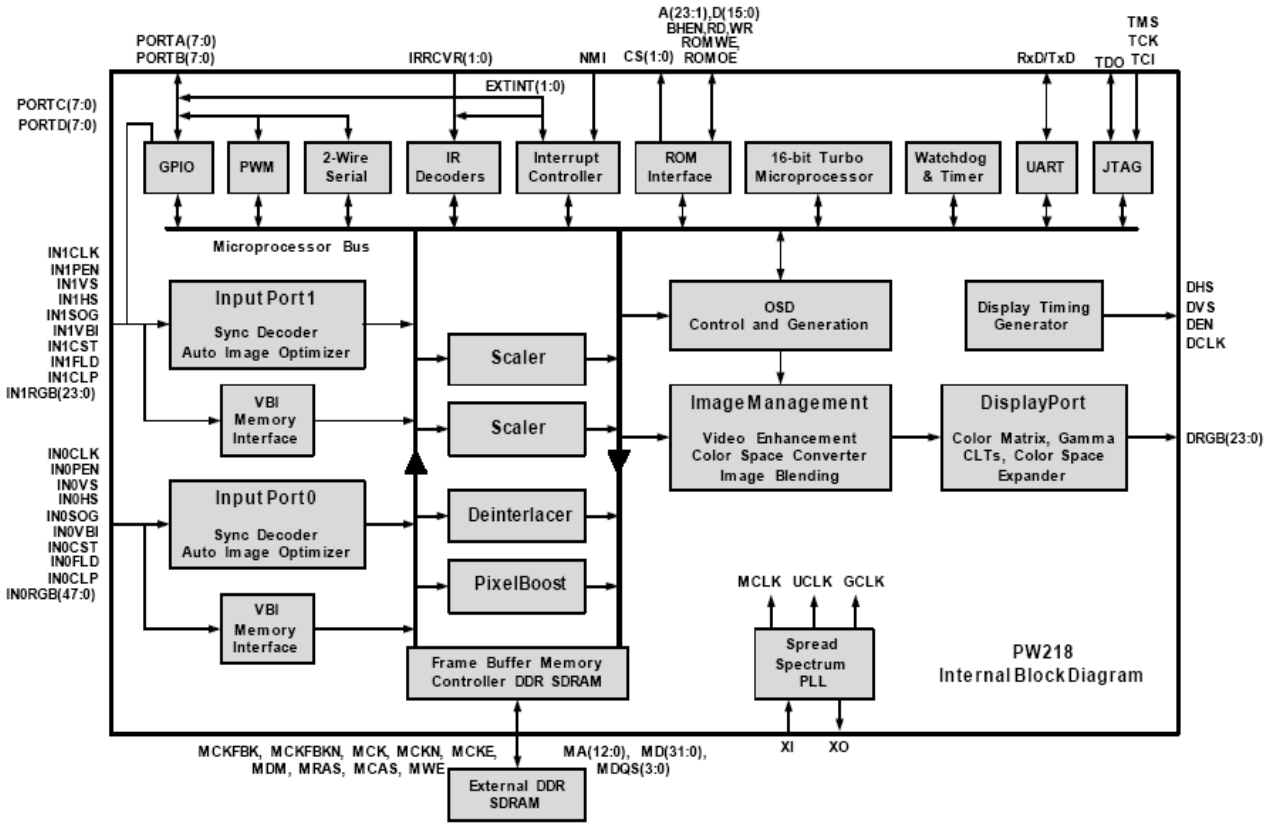
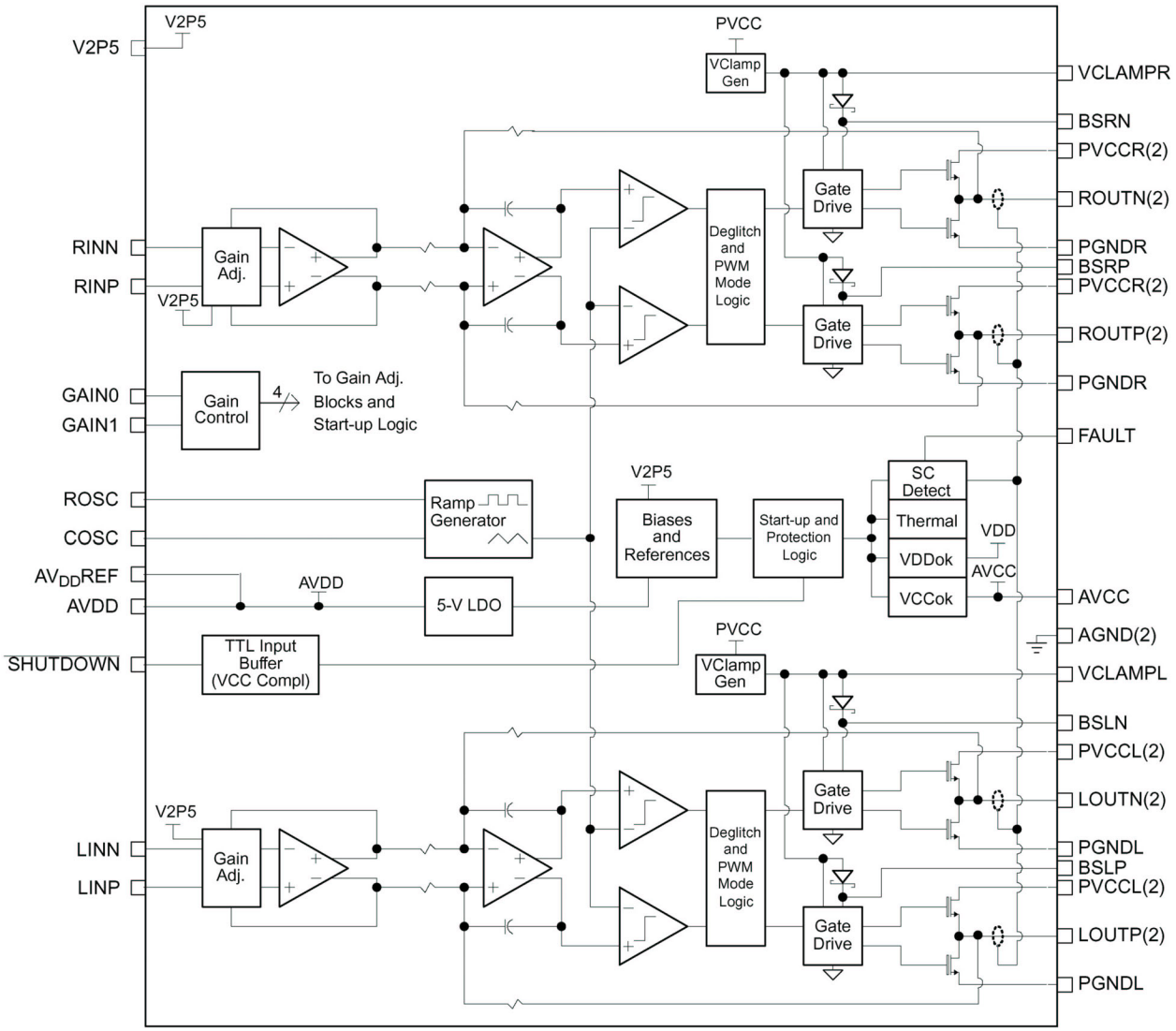


Figure 1-1 PW218 ImageProcessor Block Diagram

4. TPA3008

TPA3008 is double channel 10W stereo D class audio amplifier.

Internal Block Diagram



PINS FUNCTION

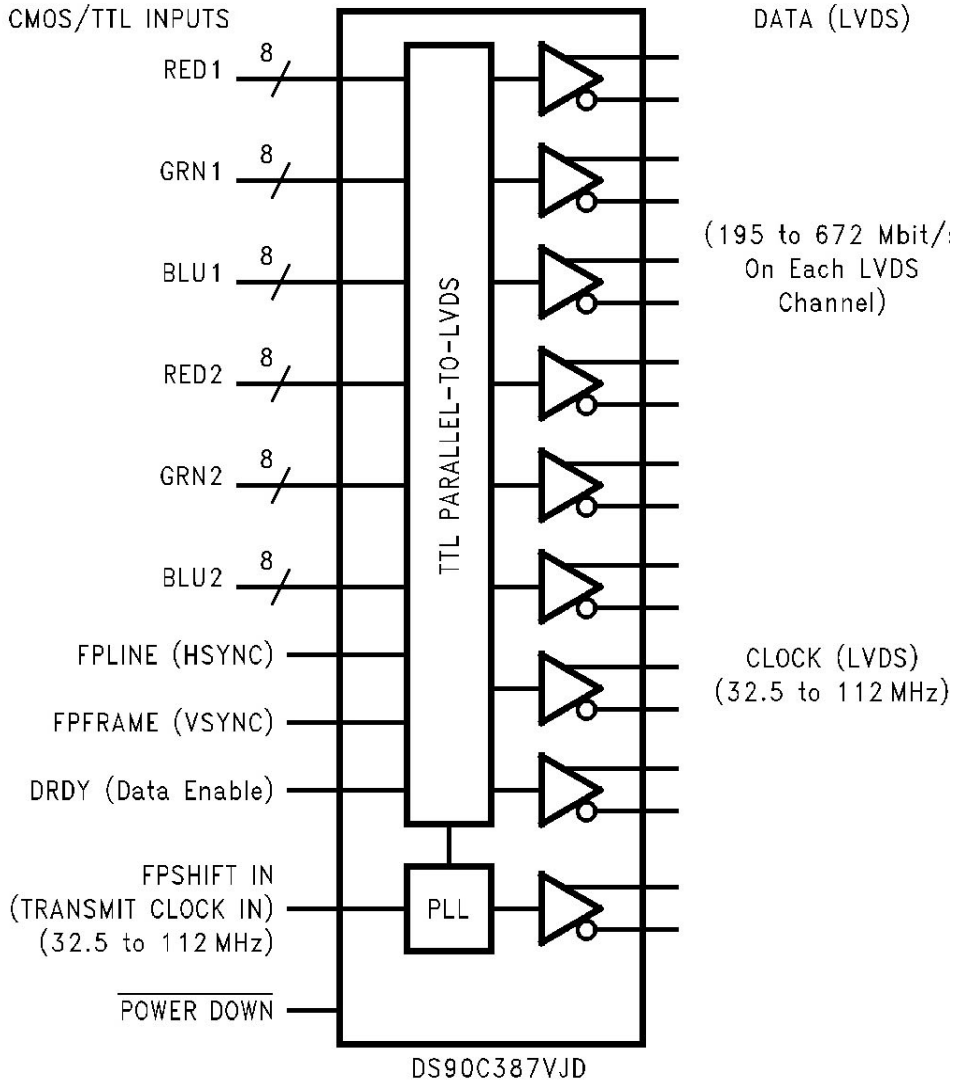
Pin	Name	Function	Pin	Name	Function
1	SHUTDOWN	Shut down control signal	17	LOUTN	Negative audio output for left channel
3	RINP	Positive audio input for right channel	20	LOUTP	Positive audio output for left channel
4	V2P5	2.5V Reference for analog cells.	27	ROSC	I/O current setting resistor for ramp generator.
5	LINP	Positive audio input for left channel	41	ROUTP	Positive audio output for right channel
11	FAULT	Volume control	44	ROUTN	Negative audio output for right channel

5. DS90C387

The DS90C387/DS90CF388 transmitter/receiver pair is designed to support dual pixel data transmission between Host and Flat Panel Display up to QXGA resolutions. The transmitter converts 48 bits (Dual Pixel 24-bit color) of CMOS/TTL data into 8 LVDS (Low Voltage Differential Signalling) data streams. Control signals (VSYNC, HSYNC, DE and two user-defined signals) are

sent during blanking intervals. At a maximum dual pixel rate of 112MHz, LVDS data line speed is 672Mbps, providing a total throughput of 5.38Gbps (672 Megabytes per second). Two other modes are also supported. 24-bit color data (single pixel) can be clocked into the transmitter at a maximum rate of 170MHz. In this mode, the transmitter provides single-to-dual pixel conversion, and the output LVDS clock rate is 85MHz maximum. The third mode provides inter-operability with FPD-Link devices.

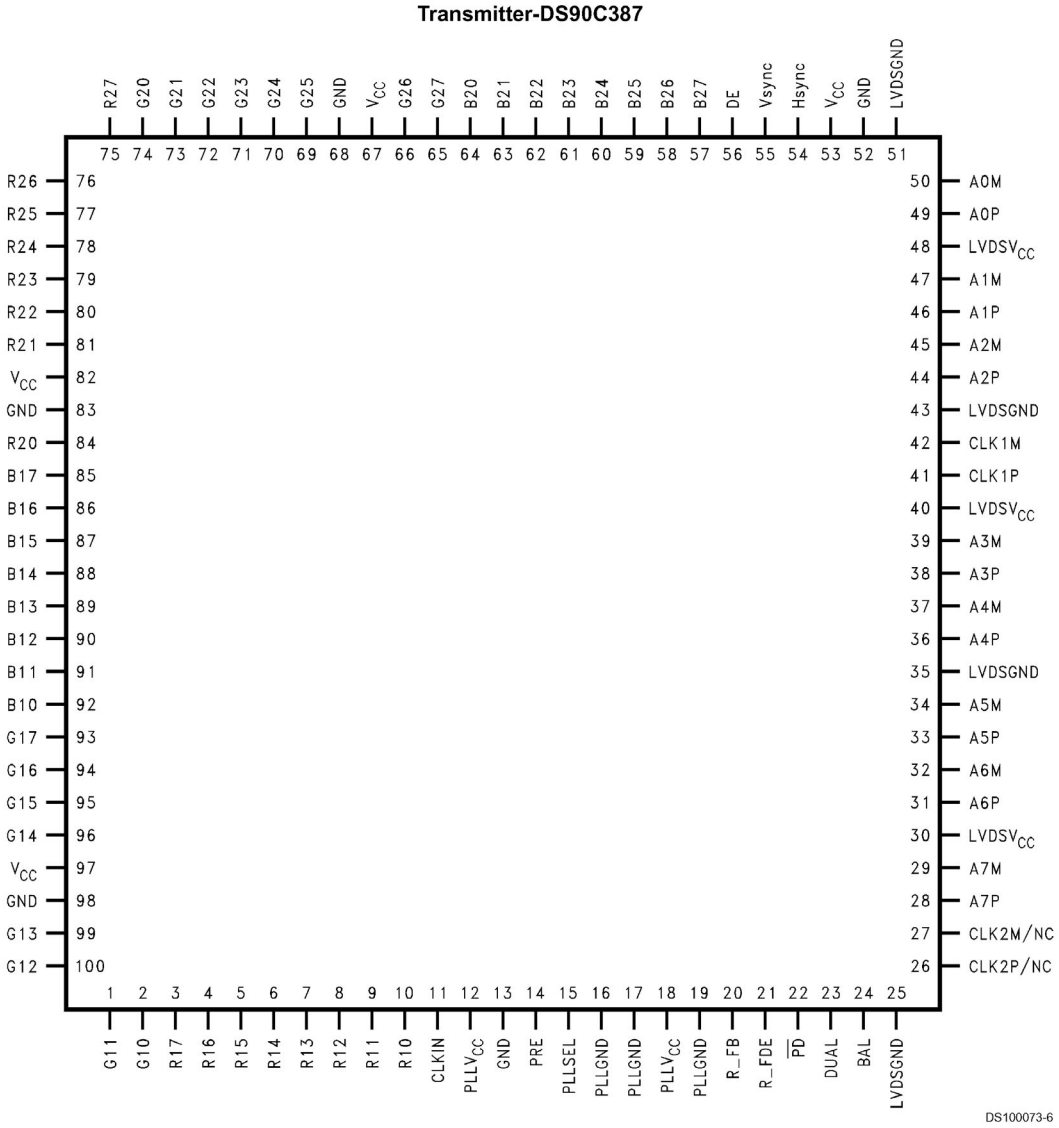
Internal Block Diagram



Pin Description

No.	Pin name	Description	No.	Pin name	Description
11	CLKIN	Clock input	3-10	TTL	Red data
54	HSYNC	Horizontal sync	93-100, 1, 2	TTL	Greed data
55	YSYNC	Vertical sync	85-92	TTL	Blue data

Pin Diagram



6. M62494 (SRS 3D Stereo + SRS 3D Mono processor)

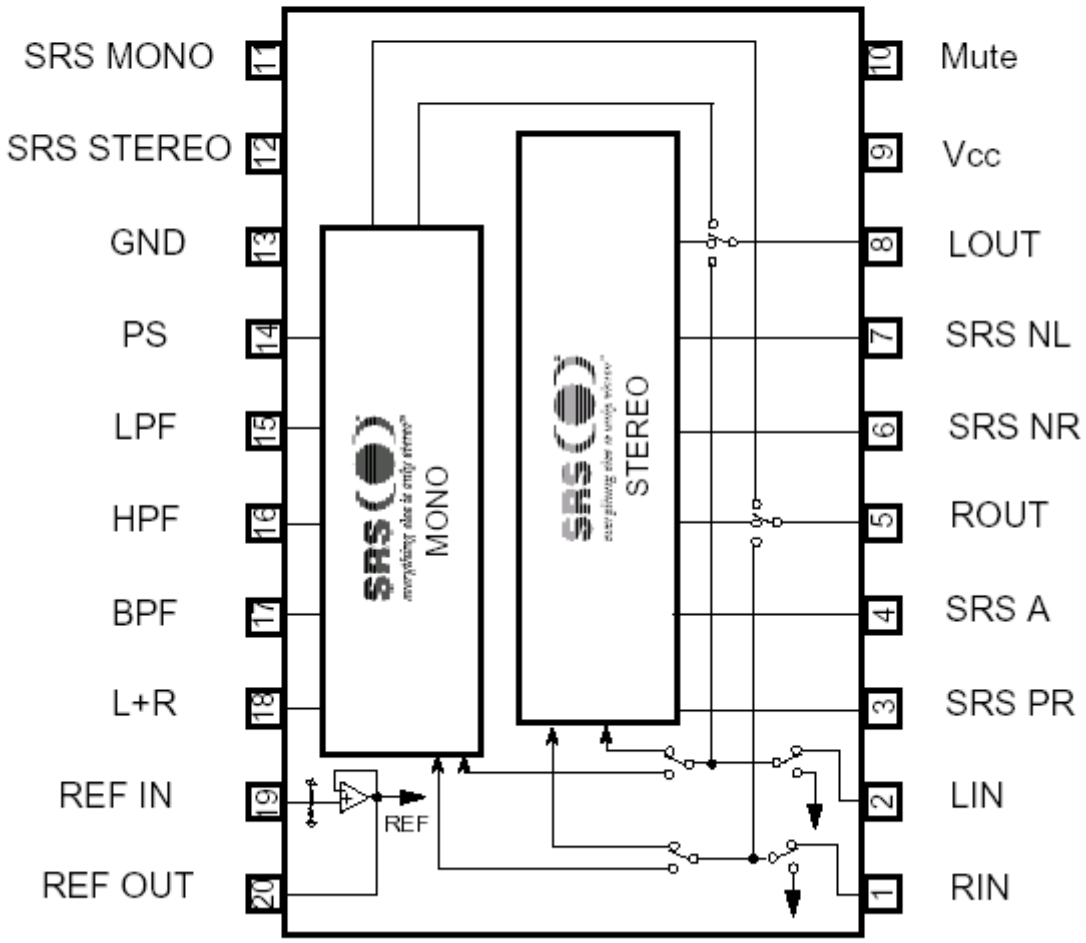
M62494 has SRS 3D STEREO and SRS 3D MONO. There are three modes, those are SRS 3D stereo SRS 3D mono and bypass. Each mode can be set by terminals.

Pin Description

Pin	Name	Description	Pin	Name	Description
1	Rin1	Right channel of audio input	9	VCC	Power
2	Lin1	Left channel of audio input	10	MUTE	Mute
5	Rout	Right channel of audio output	11	SRS STEREO ON OFF	SRS stereo switch
8	Lout	Left channel of audio output	12	SRS MONO ON OFF	SRS MONO switch

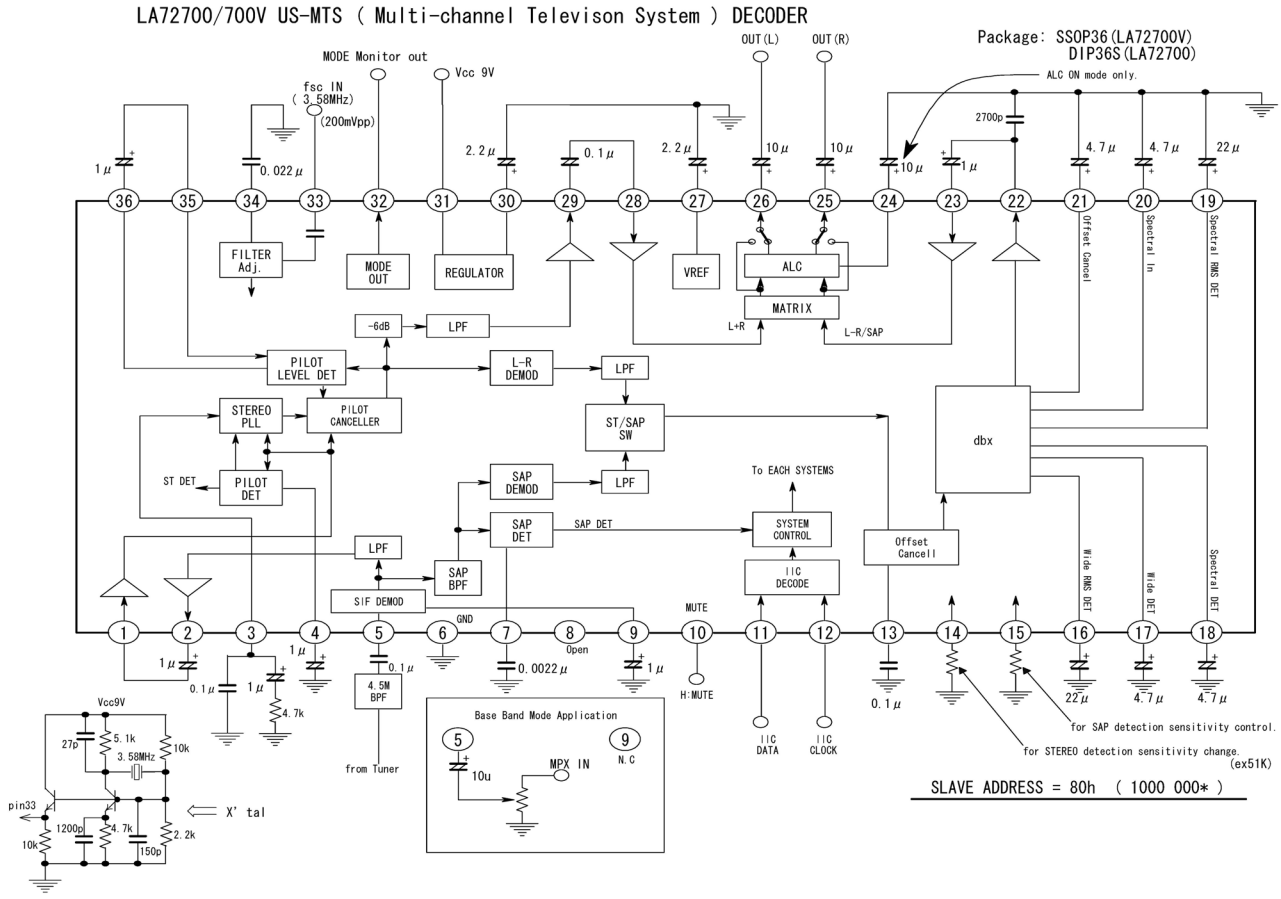
Internal Block Diagram

Block Diagram



7. L72700

Internal Block Diagram



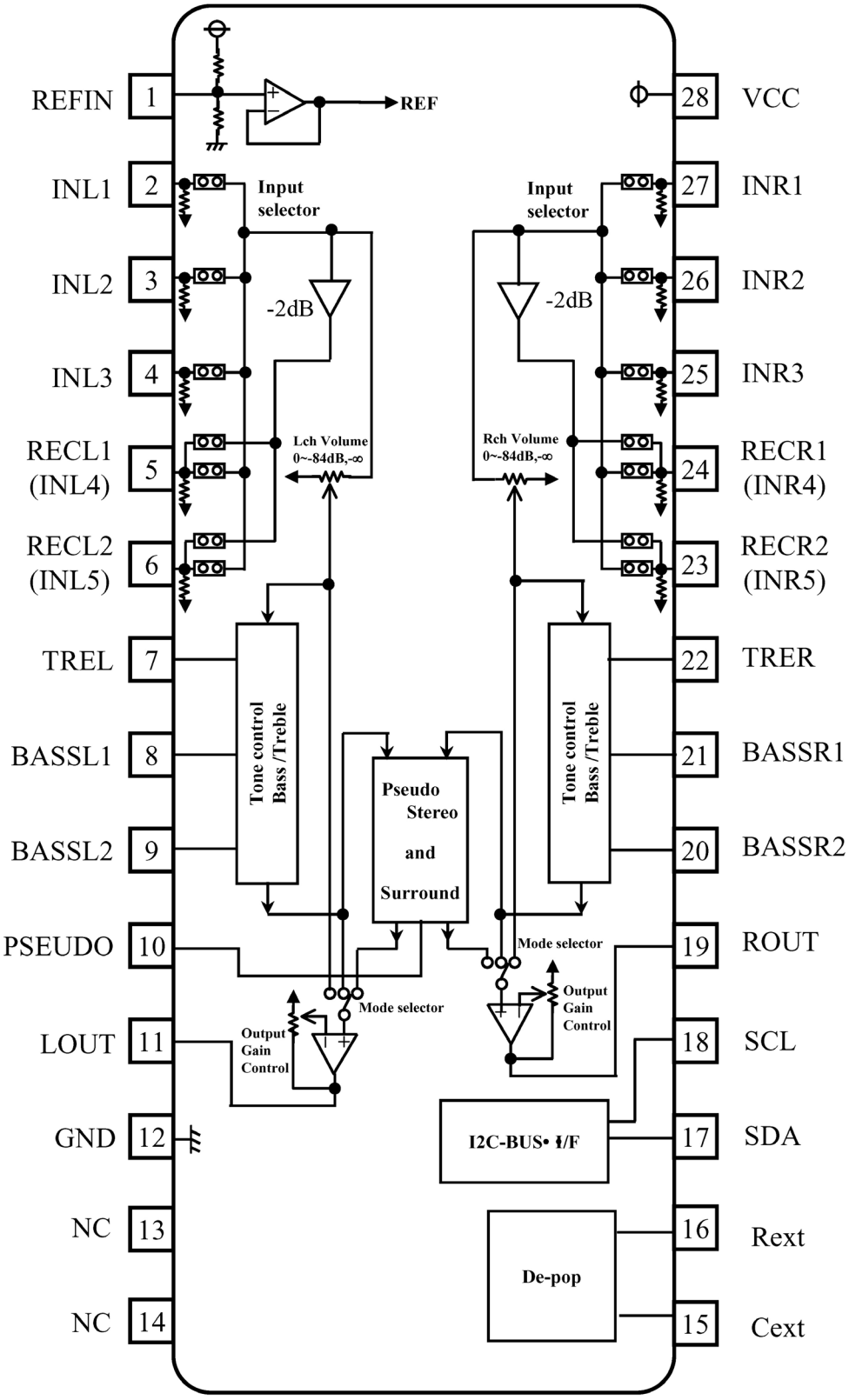
Pin description

Pin	Name	Description	Pin	Name	Description
5	PISIF	IF of Sound input	25	R OUT	Right channel of audio output
11	SDA	I2C bus	26	LOUT	Left channel of audio output
12	SCL	I2C clock	31	VCC	9V supply power

8. R2SI5900SP

Internal Block Diagram

BLOCKDIAGRAM AND PIN CONFIGURATION(TOP VIEW)



PIN description

2, 27 right/left channel of audio

3, 26 HDMI(right/left channel of audio)

4, 25 VGA(right/left channel of audio)

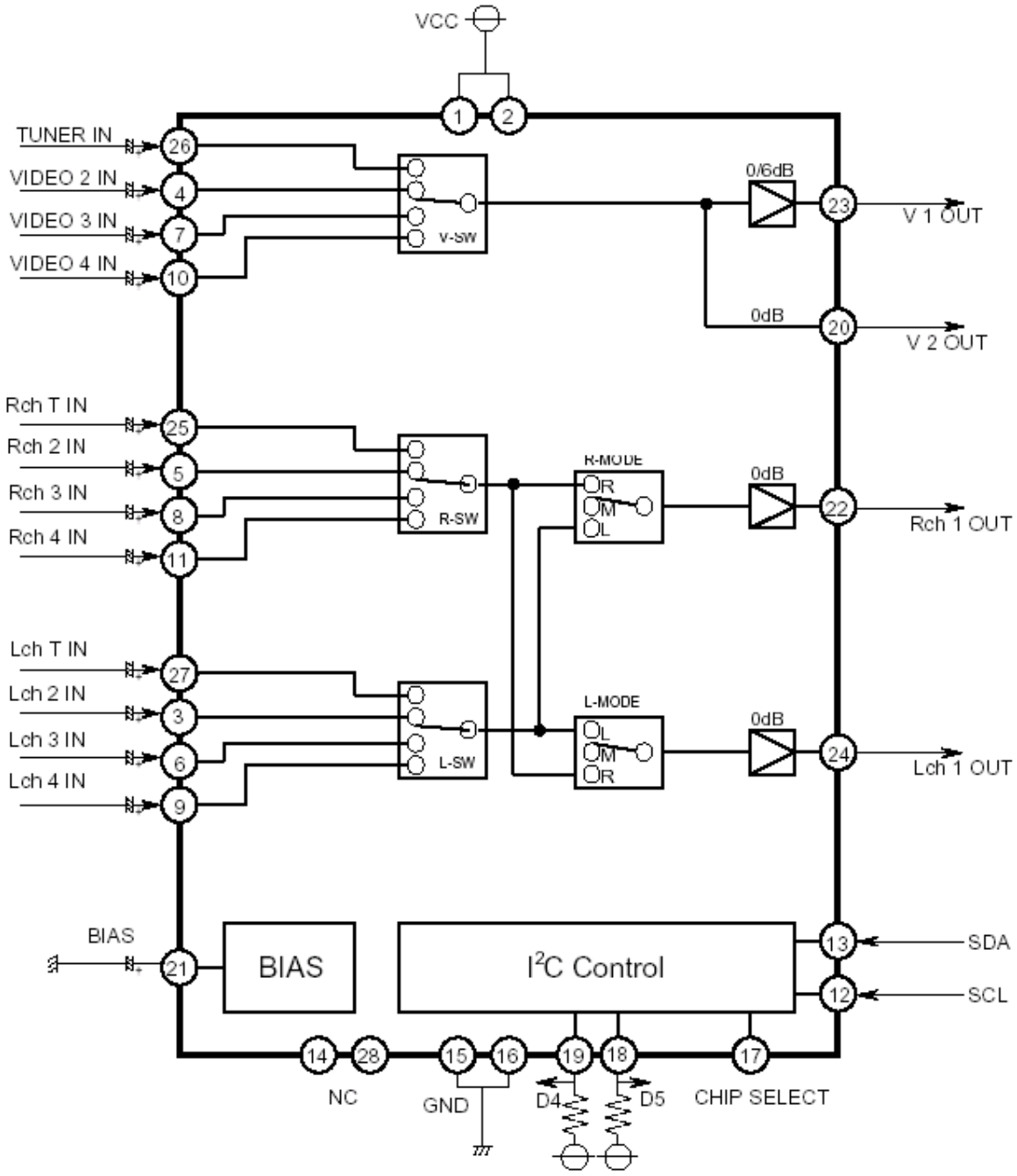
5, 24 YpbPr1(right/left channel of audio)

11, 19 output the power amplifier(right/left channel of audio)

9. M52797D

Internal Block Diagram

BLOCK DIAGRAM

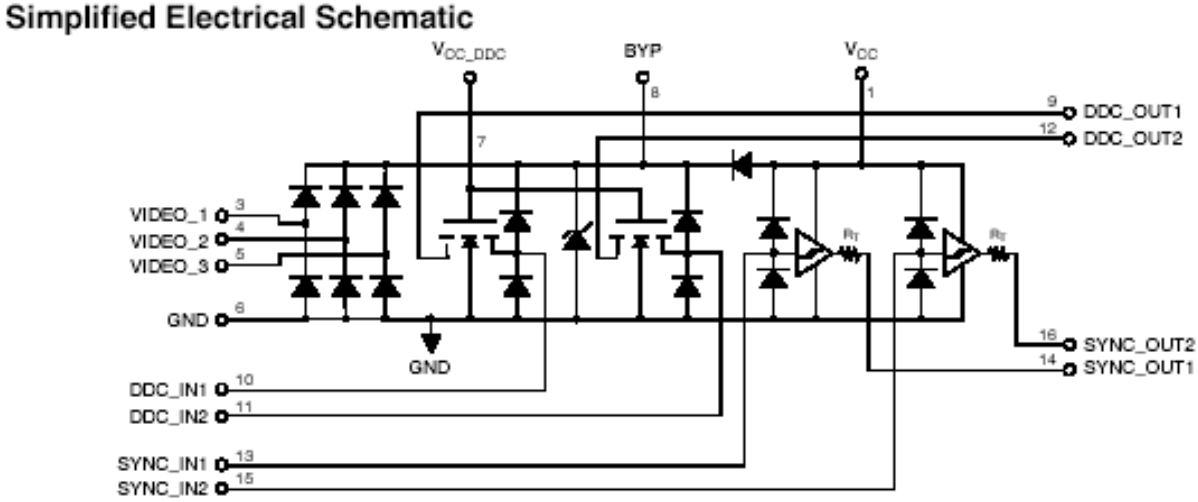


Pin description

Pin	Name	Description	Pin	Name	Description
3	HD2_L	Audio input	5	HD2_R	Audio input
6	AV1_L	Audio input	8	AV1_R	Audio input
9	AV2_L	Audio input	11	AV2_R	Audio input
27	TV_L	Audio input	25	TV_R	Audio input
24		Left audio channel output	22		Right audio channel output

10.CM2006

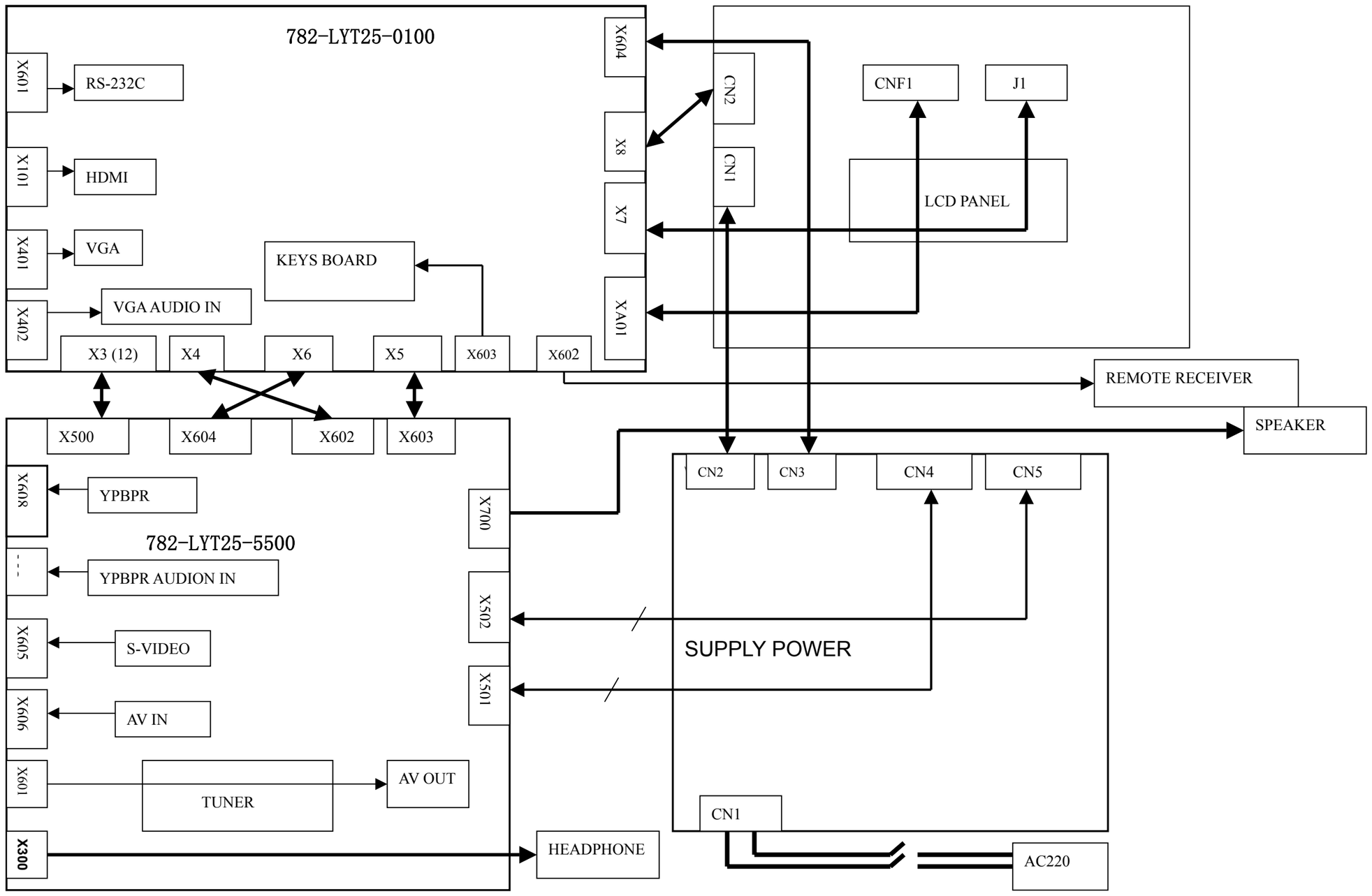
Internal Block Diagram



Pin description

Pin	Name	Description	Pin	Name	Description
1	VCC	3.3V	11	DDC_IN2	DDC _input2
3, 4, 5	VIDEO_1_2_3	Video input	12	DDC_OUT2	DDC output
6	GND	GND	13	SYNC_IN1	Sync input1
7	Vcc-DDC	5V DDC	14	SYNC_OUT1	Sync output1
8	BYP	Bypass capacitance	15	SYNC_IN2	sync intput2
9	DDC_OUT1	DDC output	16	SYNC_OUT2	Sync output2
10	DDC_IN1	DDC _output1			

Wiring diagram



Trouble shooting

1. Fault clearance

Before servicing please check to find the possible causes of the troubles according to the table below.

1.1 Antenna (signal):

Picture is out of focus or jumping	● Bad status in signal receiving ● Poor signal ● Check if there are failures with the electrical connector or the antenna. ● Check if the antenna is properly connected.
Fringe in picture	● Check if the antenna is correctly oriented. ● Maybe there is electric wave reflected from hilltop or building.
Picture is interfered by stripe shaped bright spots	● Possibly due to interference from automobile, train, high voltage transmission line, neon lamp etc. ● Maybe there is interference between antenna and power supply line. Please try to separate them in a longer distance. ● Maybe the shielded-layer of signal wire is not connected properly to the connector.
There appear streaks or light color on the screen	● Check if interfered by other equipment and if interfered possibly by the equipment like transmitting antenna, non-professional radio station and cellular phone.

1.2 TV set:

Symptoms	Possible cause
Unable to switch the power on	● Check to see if the power plug has been inserted properly into the socket.
No picture and sound	● Check to see if the power supply of liquid crystal TV has been switched on. (As can be indicated by the red LED at the front of the TV set) ● See if it's receiving the signal that is transmitted from other source than the station ● Check if it's connected to the wrong terminal or if the input mode is correct. ● Check if the signal cable connection between video frequency source and the liquid crystal TV set is correct.
Deterioration of color phase or color tone	● Check if all the picture setups have been corrected.
Screen position or size is not proper	● Check is the screen position and size is correctly set up.
Picture is twisted and deformed	● Check to see if the picture-frame ratio is properly set up.
Picture color changed or colorless	● Check the "Component" or "RGB" settings of the liquid crystal TV set and make proper adjustment according to the

	signal types.
Picture too bright and there is distortion in the brightest area	● Check if the contrast setting is too high. ● Possibly the output quality of DVD broadcaster is set too high. ● It maybe also due to improper terminal connection of the video frequency signal in a certain position of the system.
Picture is whitish or too bright in the darkest area of the picture	● Check if the setting for the brightness is too high ● Possibly the brightness grade of DVD player (broadcaster) is set too high.
No picture or signal produced from the displayer if “XXX in search” appears.	● Check if the cable is disconnected. ● Check if it’s connected to the proper terminal or if the input mode is correct.
There appears an indication - “outside the receivable scope)	● Check if the TV set can receive input signal. The signal is not correctly identified and VGA format is beyond the specified scope.
Remote control cannot work properly	● Check if the batteries are installed in the reverse order. ● Check if the battery is effective. ● Check the distance or angle from the monitor. ● Check if there is any obstruct between the remote control and the TV set. ● Check if the remote control signal- receiving window is exposed to strong fluorescence.
No picture and sound, but only hash.	● Check if the antenna cable is correctly connected, or if it has received the video signal correctly.
Blur picture	● Check if the antenna cable is correctly connected. ● Of if it has received the right video signal.
No sound	● Check if the “mute” audio frequency setting is selected. ● Check if the sound volume is set to minimum. ● Make sure the earphone is not connected. ● Check if the cable connection is loose.
When playing VHS picture search tape, there are lines at the top or bottom of the picture.	● When being played or in pause VHS picture search tape sometimes can’t provide stable picture, which may lead to incorrect display of the liquid crystal TV, In this case please press “auto” key on the remote control so as to enable the liquid crystal TV set to recheck the signal and then to display correct picture signal

2. Identification criteria for the bright spot and dark spot of the LCD screen

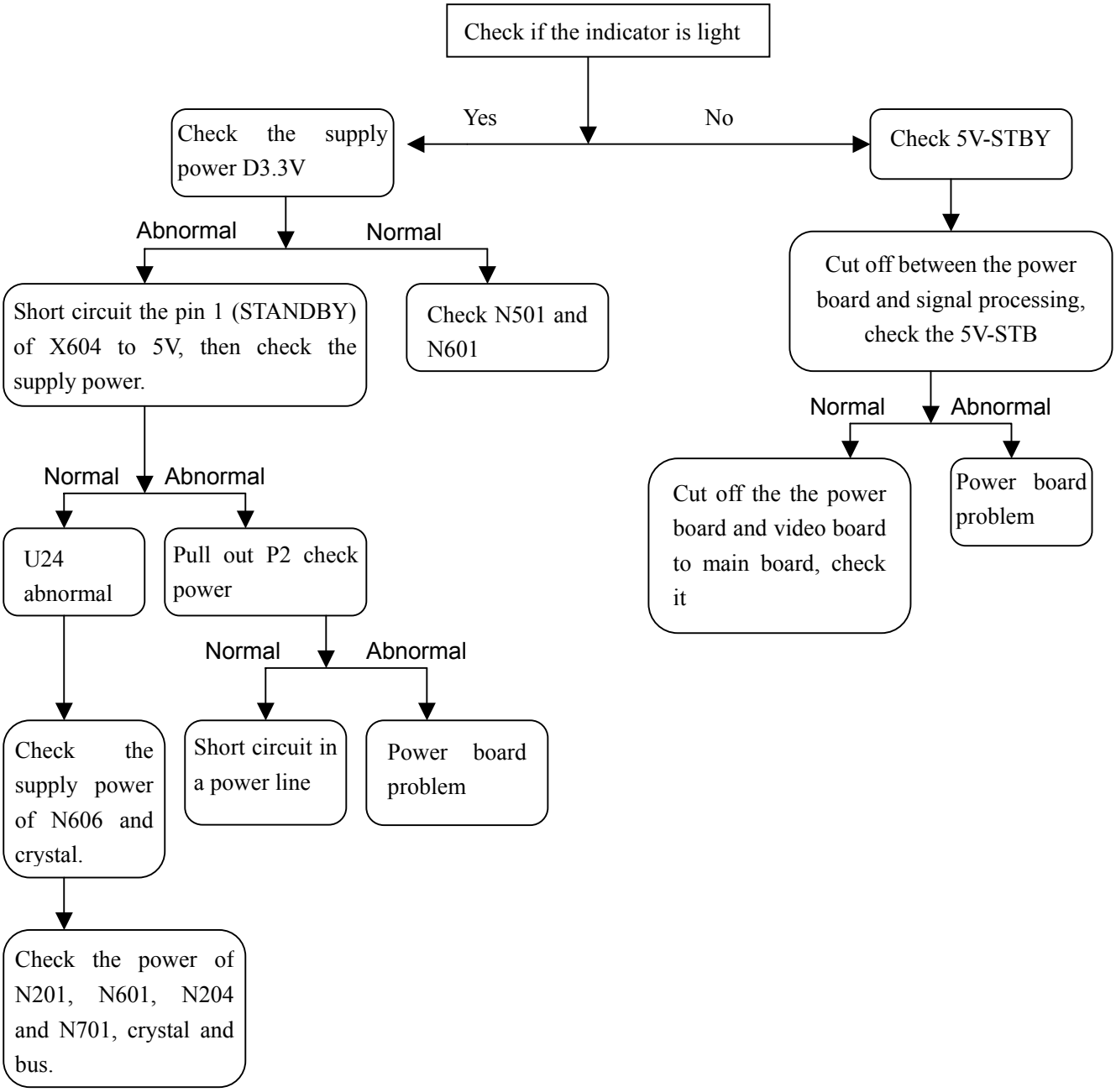
<table>
<tr><td rowspan="2">Category</td><td rowspan="2">Criteria</td><td colspan="5">Quantity allowed</td><td colspan="5">Distance between two spots</td></tr>
<tr><td>15"</td><td>20"</td><td>22"</td><td>30"</td><td>40"</td><td>15"</td><td>20"</td><td>22"</td><td>30"</td><td>40"</td></tr>
<tr><td rowspan="3">Bright spot</td><td>One single spot</td><td>≤5</td><td>≤2</td><td>≤5</td><td>≤2</td><td>≤3</td><td rowspan="5">≥15mm</td><td colspan="4" rowspan="3">≥15mm</td></tr>
<tr><td>Two neighboring spots</td><td>≤2</td><td>≤1</td><td>≤2</td><td>≤1</td><td>≤1</td></tr>
<tr><td>Total No.</td><td>≤5</td><td>≤2</td><td>≤5</td><td>≤2</td><td>≤3</td></tr>
<tr><td rowspan="3">Dark spots</td><td>One single spot</td><td>≤6</td><td>≤7</td><td>≤5</td><td>≤4</td><td>≤10</td><td rowspan="3">≥10mm</td><td colspan="3" rowspan="3">≥5mm</td></tr>
<tr><td>Two neighboring spots</td><td>≤2</td><td>≤2</td><td>≤2</td><td>≤1</td><td>≤5</td></tr>
<tr><td>Total No.</td><td>≤6</td><td>≤7</td><td>≤5</td><td>≤4</td><td>≤10</td></tr>
<tr><td colspan="2">Total defected point</td><td>≤8</td><td>≤7</td><td>≤5</td><td>≤4</td><td>/</td><td colspan="4"></td></tr>
</table>

Notes:

1. Definition of defected point (bright spot, dark spot): It is identified as a defected point if its area exceeds 1/2 of a single picture element (R, G, B).
2. Definition of bright spot: It is identified as a bright spot if it is bright in the state of dark field and its bright size remains unchanged
3. Definition of dark spot: It is identified as a dark spot if it is dark in the state of white field and its dark size remains unchanged
4. Definition of two neighboring points: Defects of a group of picture elements (RB, RG, GB).

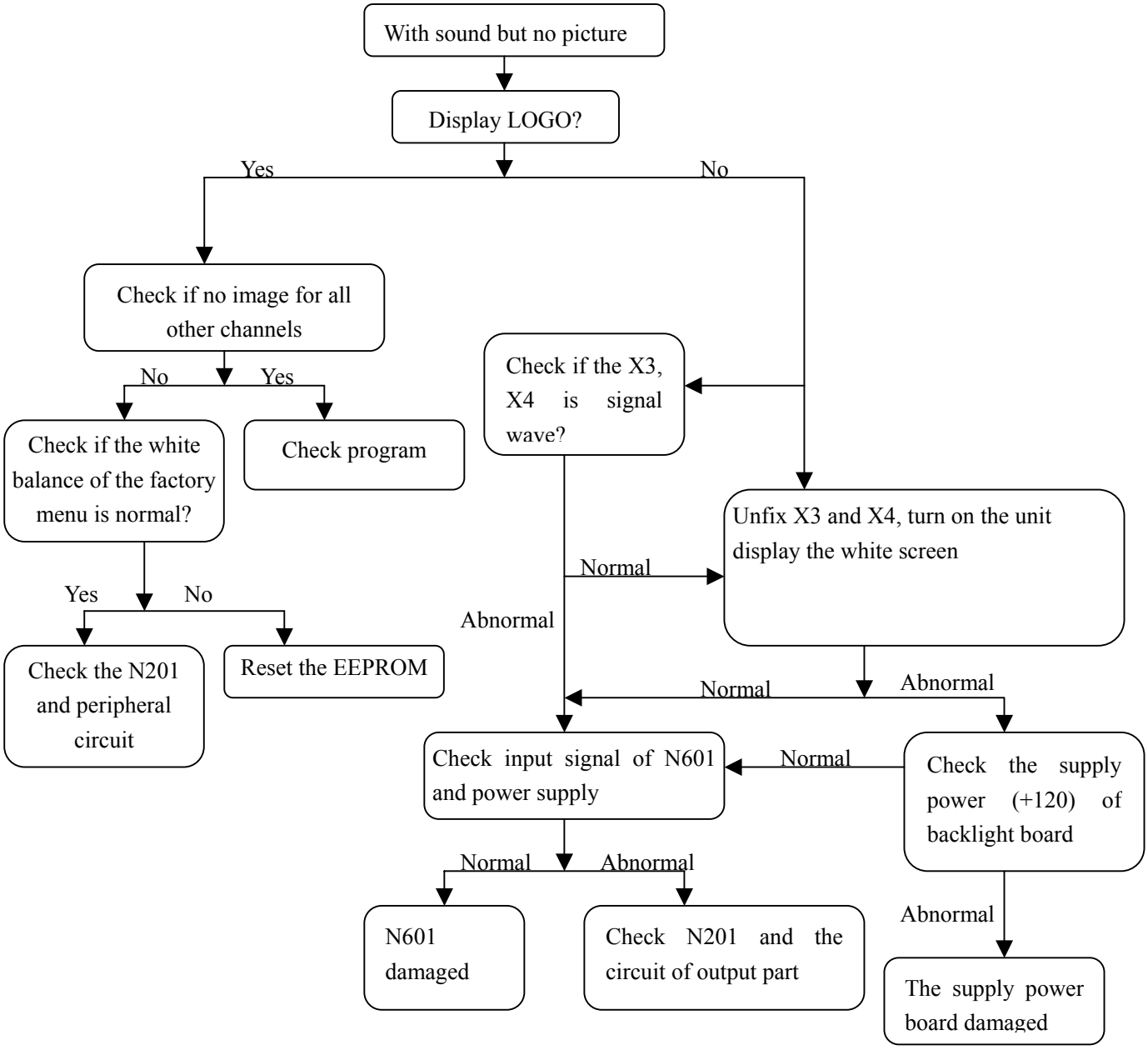
3. Troubleshooting guide

3.1 No raster, no picture and no sound

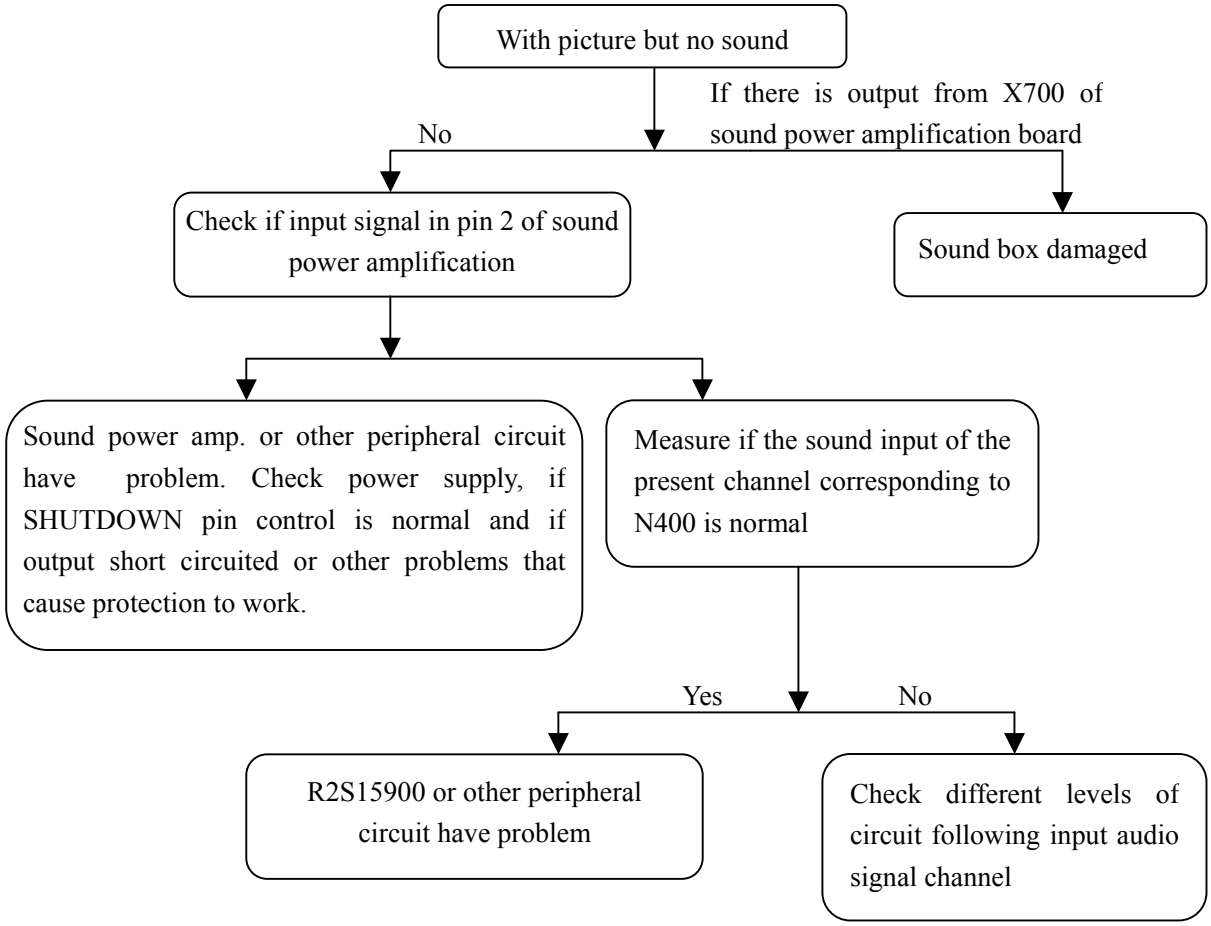

Check if the indicator is light
Yes
No
Check the supply power D3.3V
Check 5V-STBY
Abnormal
Normal
Short circuit the pin 1 (STANDBY) of X604 to 5V, then check the supply power.
Check N501 and N601
Cut off between the power board and signal processing, check the 5V-STB
Normal
Abnormal
Cut off the the power board and video board to main board, check it
Power board problem
Normal
Abnormal
U24 abnormal
Pull out P2 check power
Normal
Abnormal
Check the supply power of N606 and crystal.
Short circuit in a power line
Power board problem
Check the power of N201, N601, N204 and N701, crystal and bus.

Note: Power supply for PDP is provided with over current and over voltage protection functions. If there is over current or over voltage, this protection will function and no output.

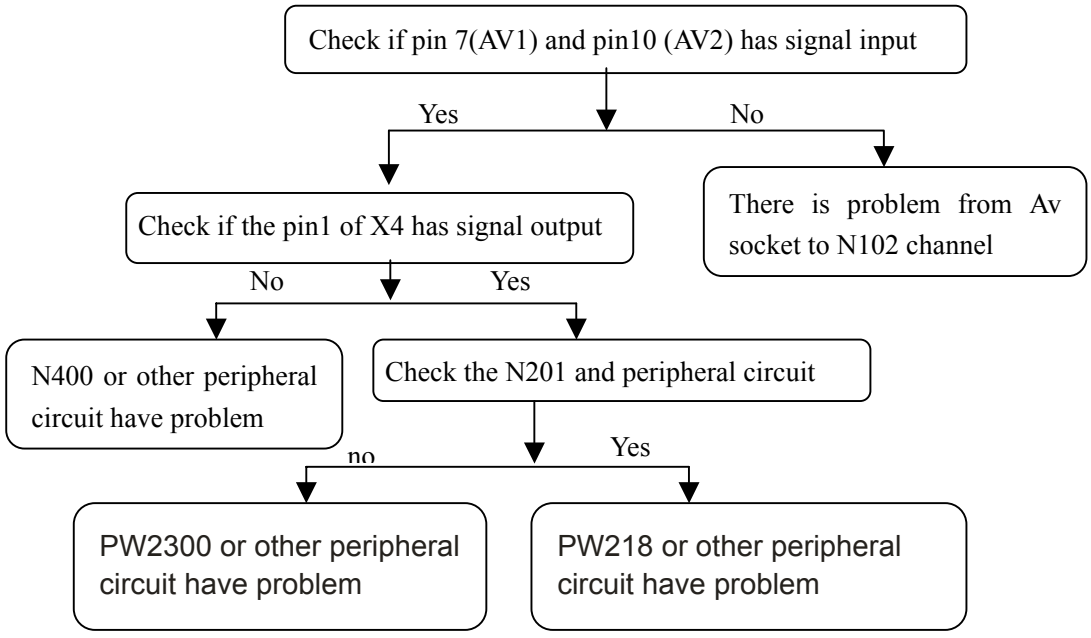
2.With sound but no picture:



3.With picture but no sound.

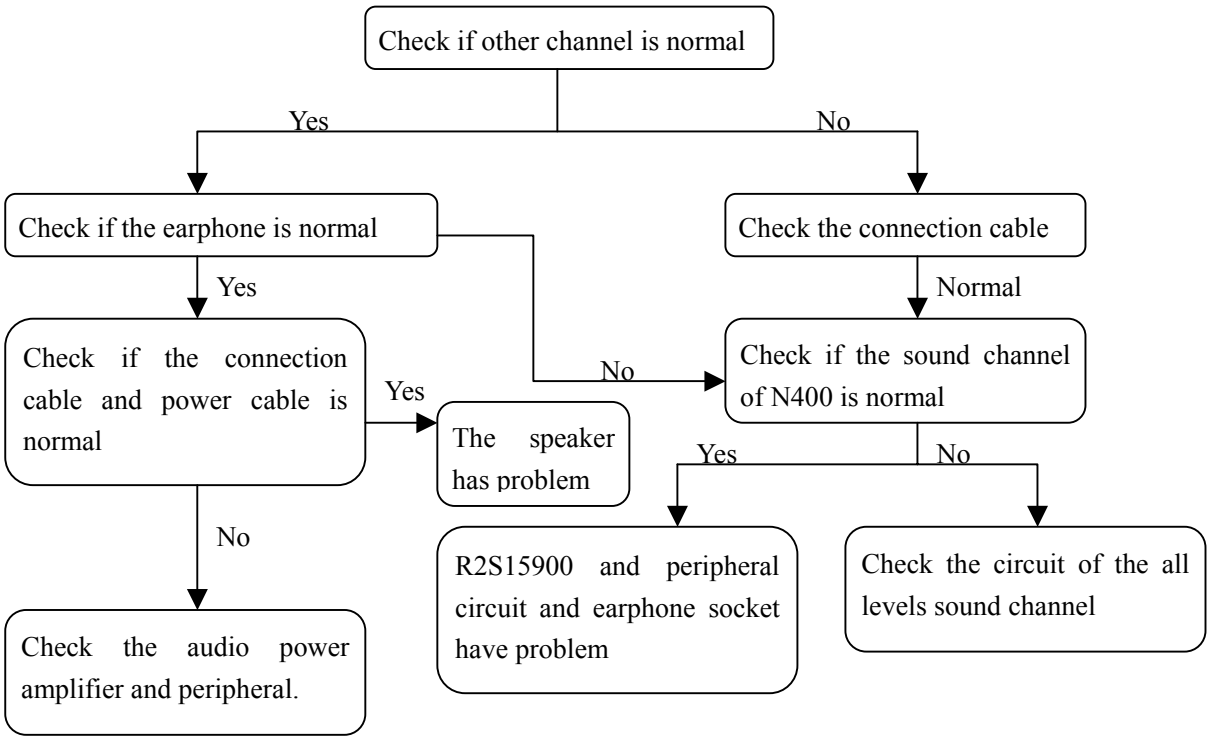

With picture but no sound
If there is output from X700 of sound power amplification board
No
Check if input signal in pin 2 of sound power amplification
Sound box damaged
Sound power amp. or other peripheral circuit have problem. Check power supply, if SHUTDOWN pin control is normal and if output short circuited or other problems that cause protection to work.
Measure if the sound input of the present channel corresponding to N400 is normal
Yes
No
R2S15900 or other peripheral circuit have problem
Check different levels of circuit following input audio signal channel

4. AV no picture

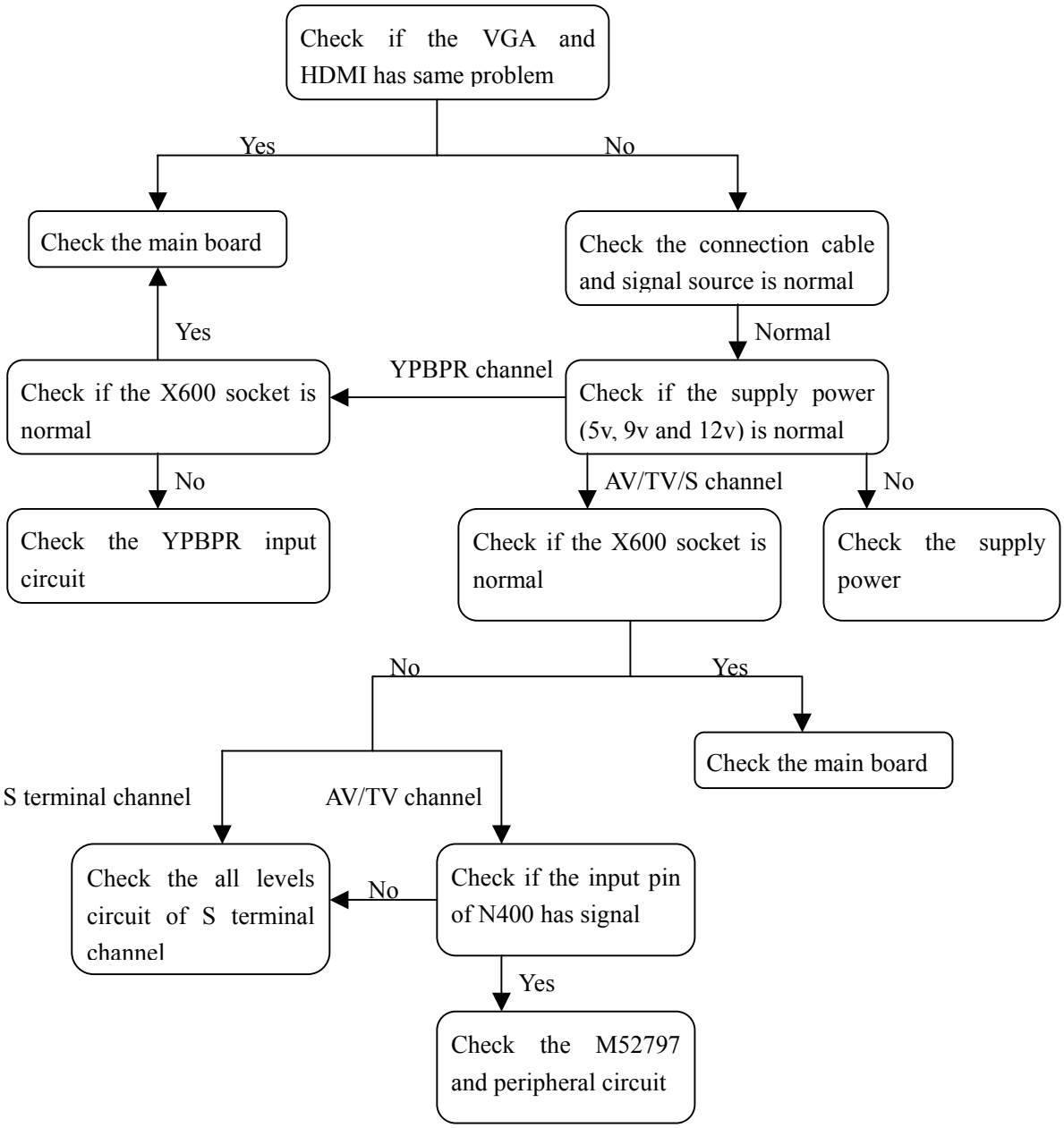

Check if pin 7(AV1) and pin10 (AV2) has signal input
Yes
No
There is problem from Av socket to N102 channel
Check if the pin1 of X4 has signal output
No
Yes
N400 or other peripheral circuit have problem
Check the N201 and peripheral circuit
no
Yes
PW2300 or other peripheral circuit have problem
PW218 or other peripheral circuit have problem

5. High frequency board overhaul flow

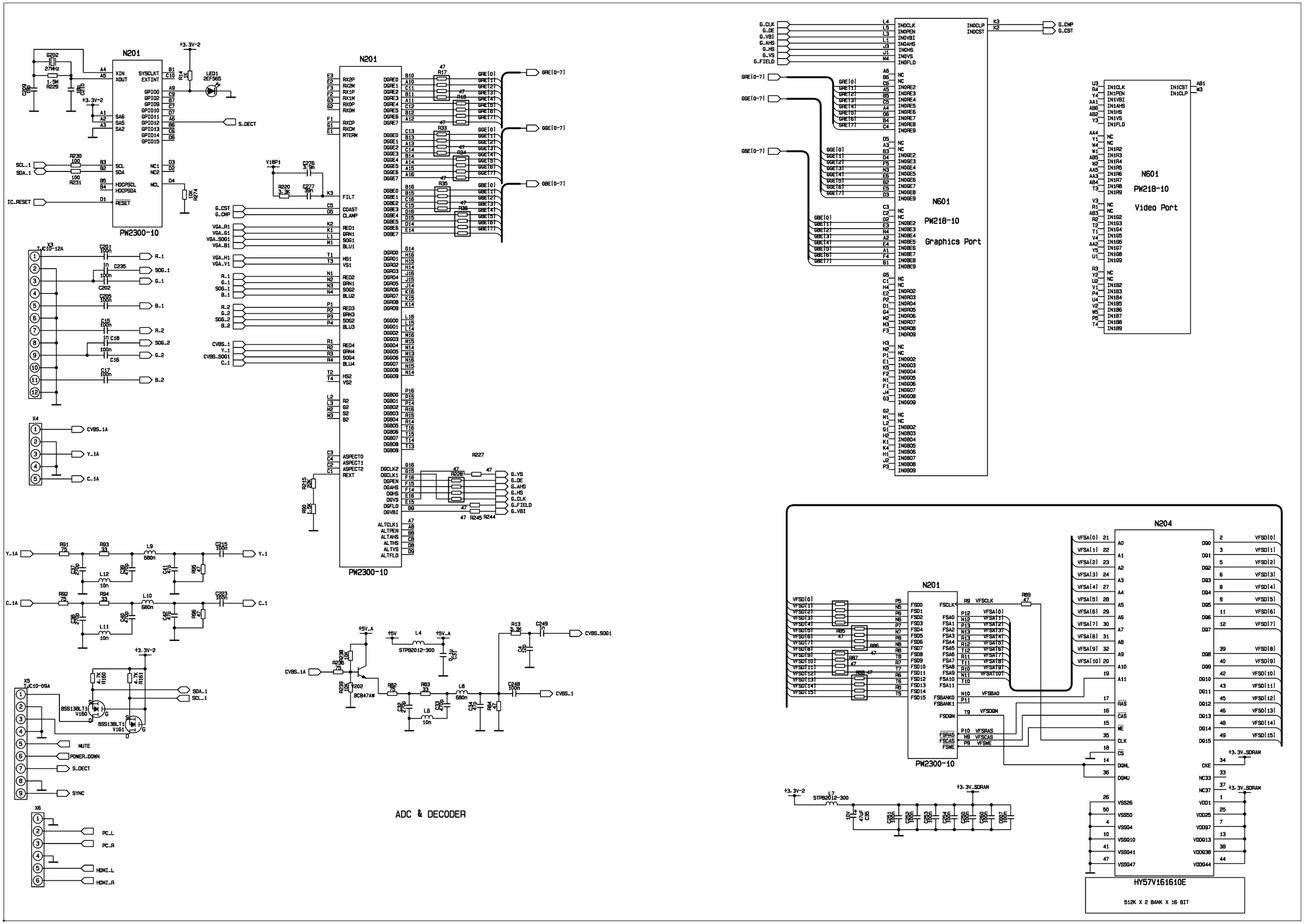
5.1 with picture but no sound

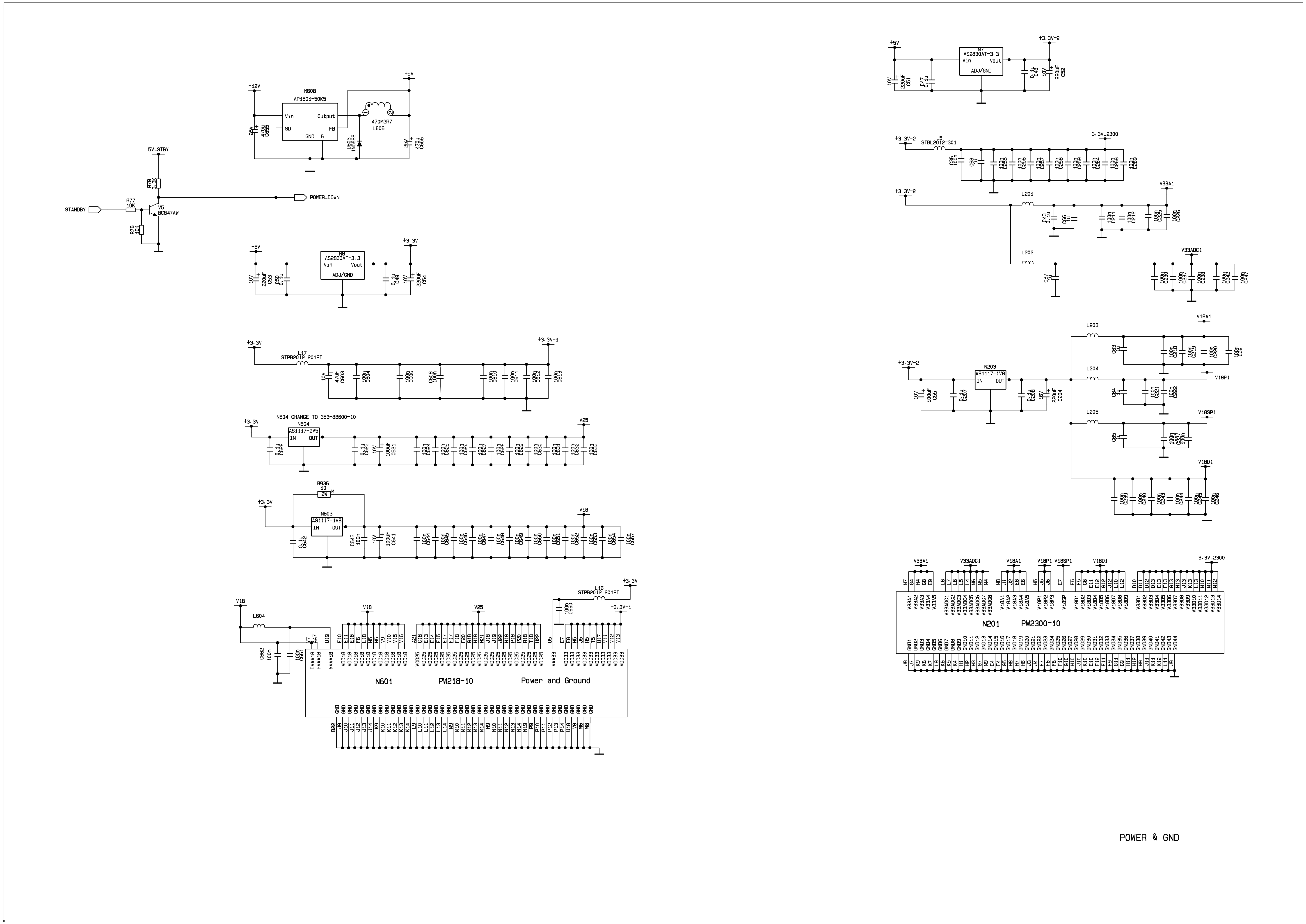

Check if other channel is normal
Yes
No
Check if the earphone is normal
Check the connection cable
Yes
Normal
Check if the connection cable and power cable is normal
Yes
No
Check if the sound channel of N400 is normal
The speaker has problem
Yes
No
No
R2S15900 and peripheral circuit and earphone socket have problem
Check the circuit of the all levels sound channel
Check the audio power amplifier and peripheral.

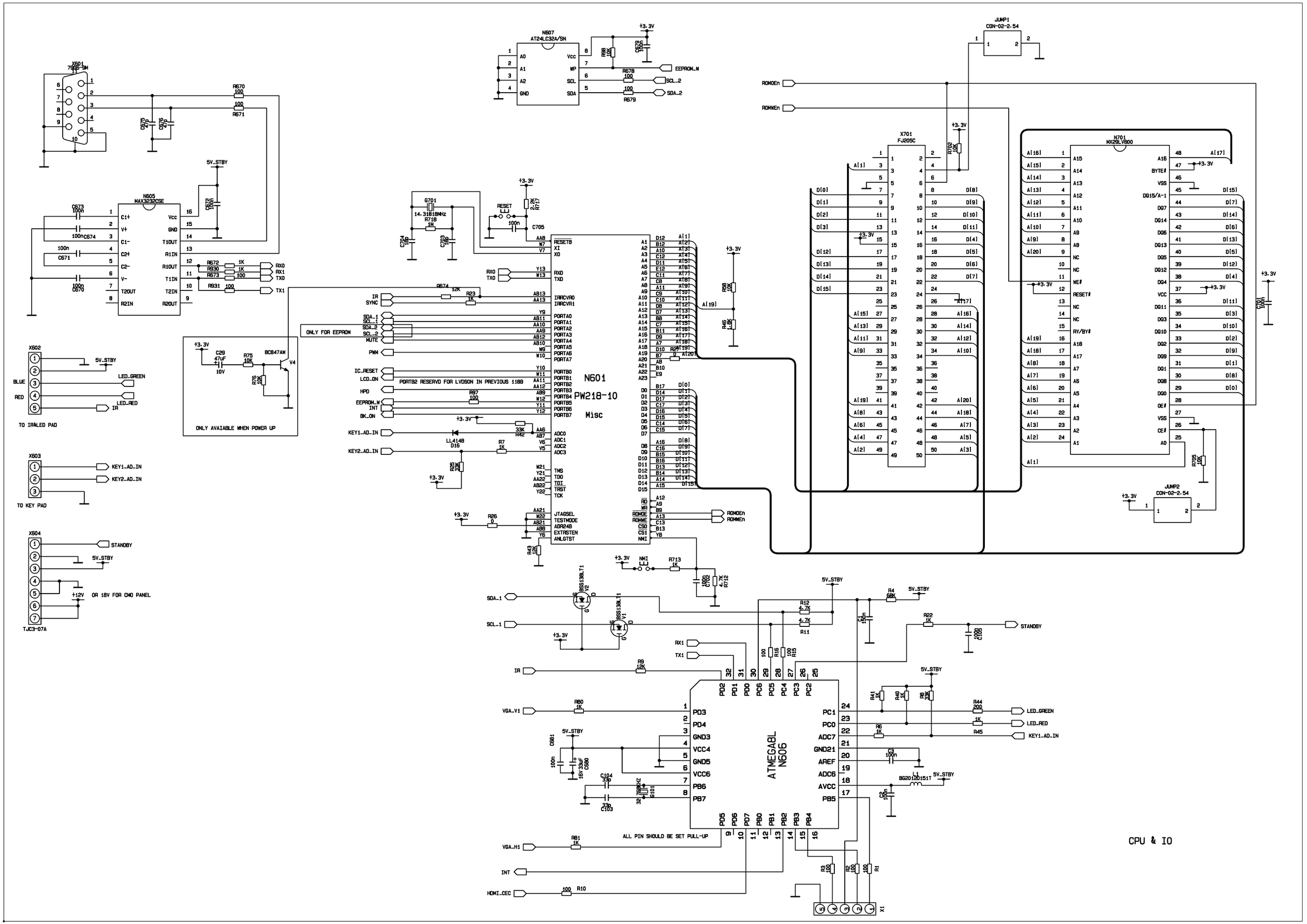
5.2 A certain channel without picture of TV/AV YPBPR

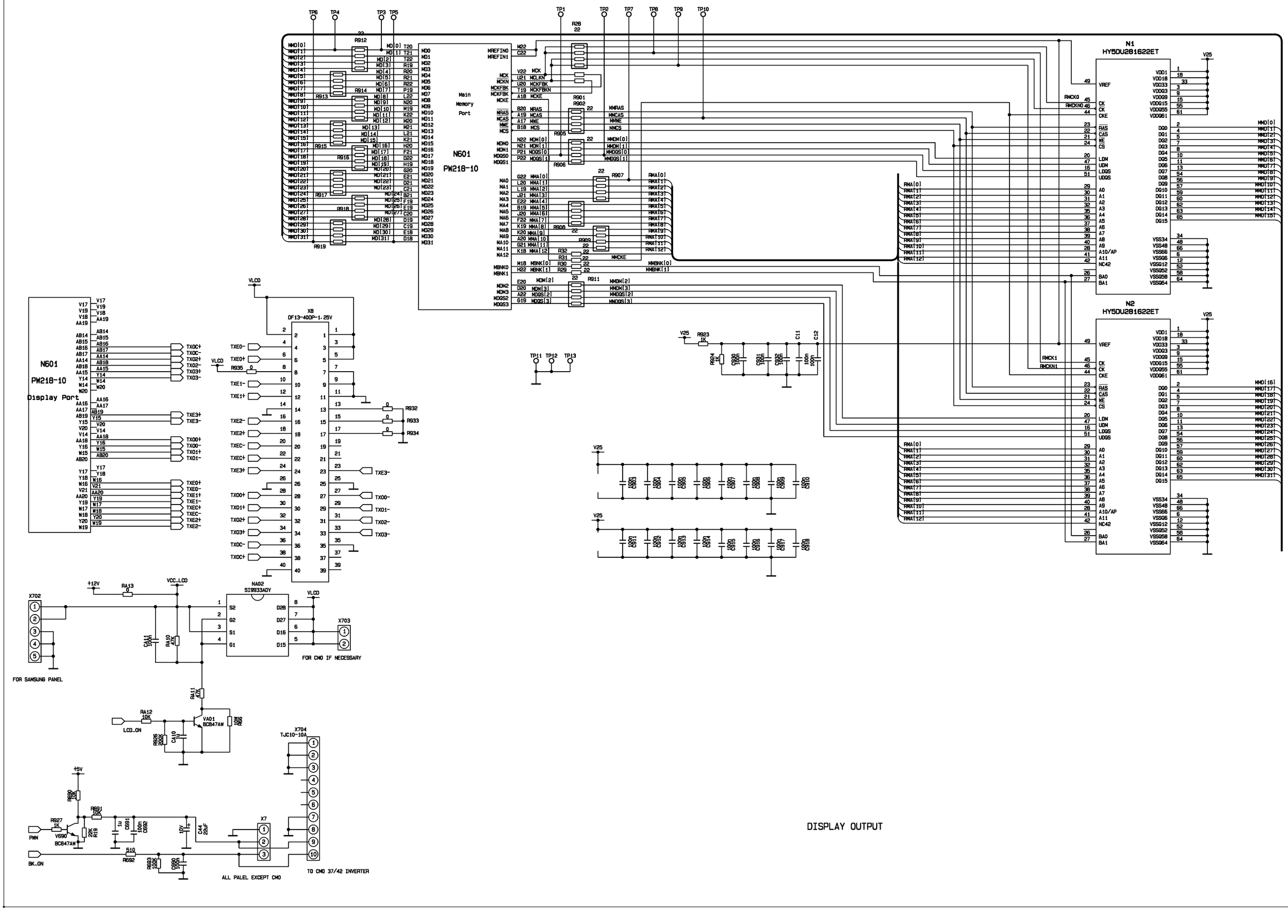

Check if the VGA and HDMI has same problem
Yes
No
Check the main board
Check the connection cable and signal source is normal
Yes
Normal
YPBPR channel
Check if the X600 socket is normal
Check if the supply power (5v, 9v and 12v) is normal
No
AV/TV/S channel
No
Check the YPBPR input circuit
Check if the X600 socket is normal
Check the supply power
No
Yes
Check the main board
S terminal channel
AV/TV channel
Check the all levels circuit of S terminal channel
No
Check if the input pin of N400 has signal
Yes
Check the M52797 and peripheral circuit

HDMI&VGA


N201
PW2300-10
N601
PW218-10
Graphics Port
Video Port
N204
HY57V161610E
512K X 2 BANK X 16 BIT
ADC & DECODER


N608
AP1501-50K5
Vin
Output
SD
FB
GND 6
+12V
+5V
25V
470u
C655
C656
D603
1N5822
470M2R7
L606
5V_STBY
R79
3.3K
POWER_DOWN
STANDBY
R77
10K
V5
BC847AW
R78
10K
N8
AS2830AT-3.3
Vin
Vout
ADJ/GND
+3.3V
10V
220uF
C53
C50
0.1u
C49
C54
L17
STPB2012-201PT
47uF
C603
100n
C604
C606
C608
C610
C611
C612
C613
+3.3V-1
N604 CHANGE TO 353-88600-10
N604
AS1117-2V5
IN
OUT
C622
C623
100uF
C621
V25
R936
10
2W
M
N603
AS1117-1V8
C642
C643
C641
V18
L604
C662
C661
L16
C660
N601
PW218-10
Power and Ground
DVAA18
PVAA18
MVAA18
VDD18
VDD25
VAA33
VDD33
GND
N7
C51
C47
C48
C52
+3.3V-2
L5
STBL2012-301
3.3V_2300
C36
C68
1u
L201
V33A1
C43
C66
L202
V33ADC1
C67
L203
V18A1
C63
L204
V18P1
N203
AS1117-1V8
C55
C207
C208
16V
C204
C64
L205
V18SP1
C65
V18D1
N201
PW2300-10
POWER & GND


N601
PW218-10
Misc
N605
MAX3232CSE
N607
AT24LC32A/SN
X601
7S6-3M
X602
TO IR&LED PAD
X603
TO KEY PAD
X604
TJC3-07A
ONLY AVAIABLE WHEN POWER UP
ONLY FOR EEPROM
PORTB2 RESERVD FOR LVDSON IN PREVIOUS 118B
ALL PIN SHOULD BE SET PULL-UP
ATMEGA8L
N606
X701
FJ205C
N701
MX29LV800
JUMP1
CON-02-2.54
JUMP2
CON-02-2.54
X1
CPU & IO

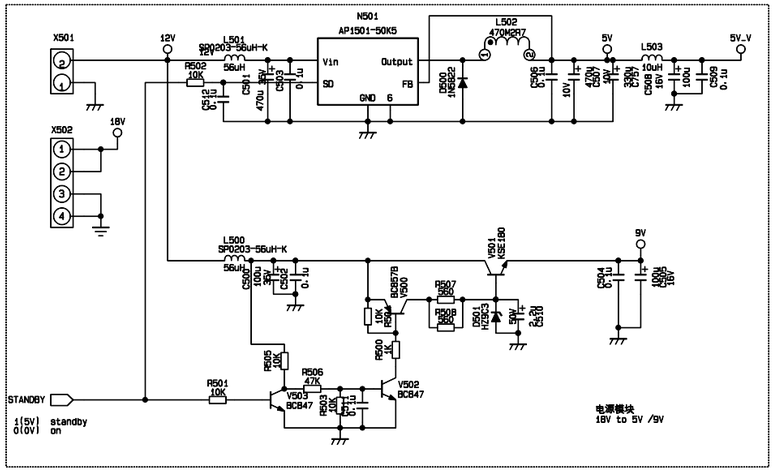

Main Memory Port
N601
PW218-10
Display Port
N1
HY5DU281622ET
N2
HY5DU281622ET
X8
DF13-40DP-1.25V
NA02
SI9933ADY
VA01
BC847AW
V690
BC847AW
X702
X703
X704
TJC10-10A
X7
FOR SAMSUNG PANEL
FOR CMO IF NECESSARY
LCD_ON
PWN
BK_ON
ALL PALEL EXCEPT CMO
TO CMO 37/42 INVERTER
DISPLAY OUTPUT

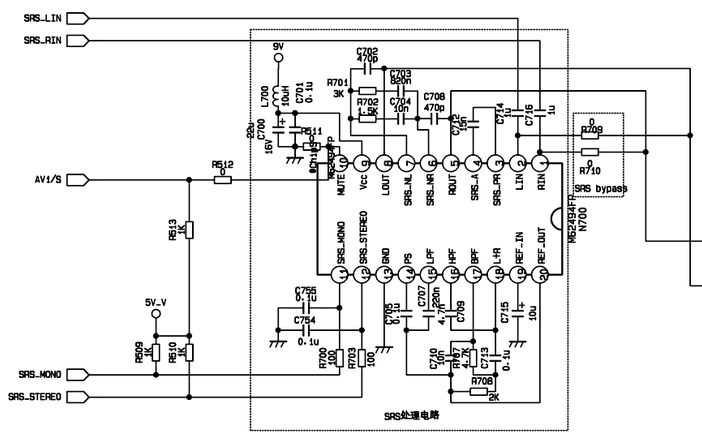
更改部分：

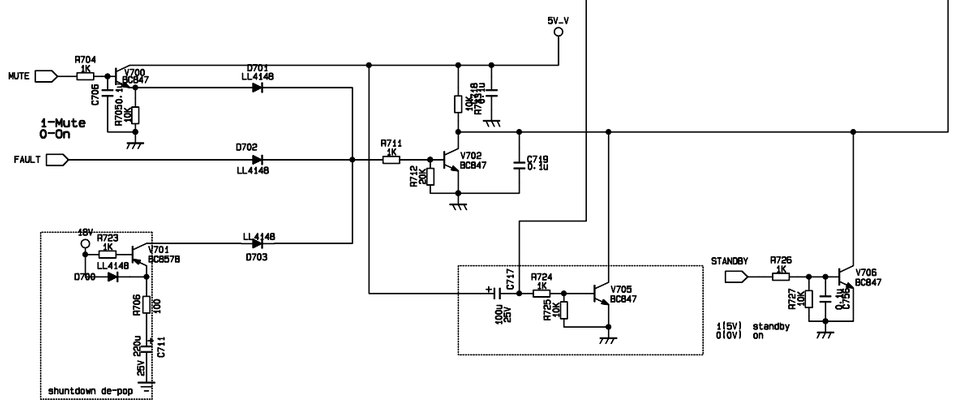
耳机插座开关更改

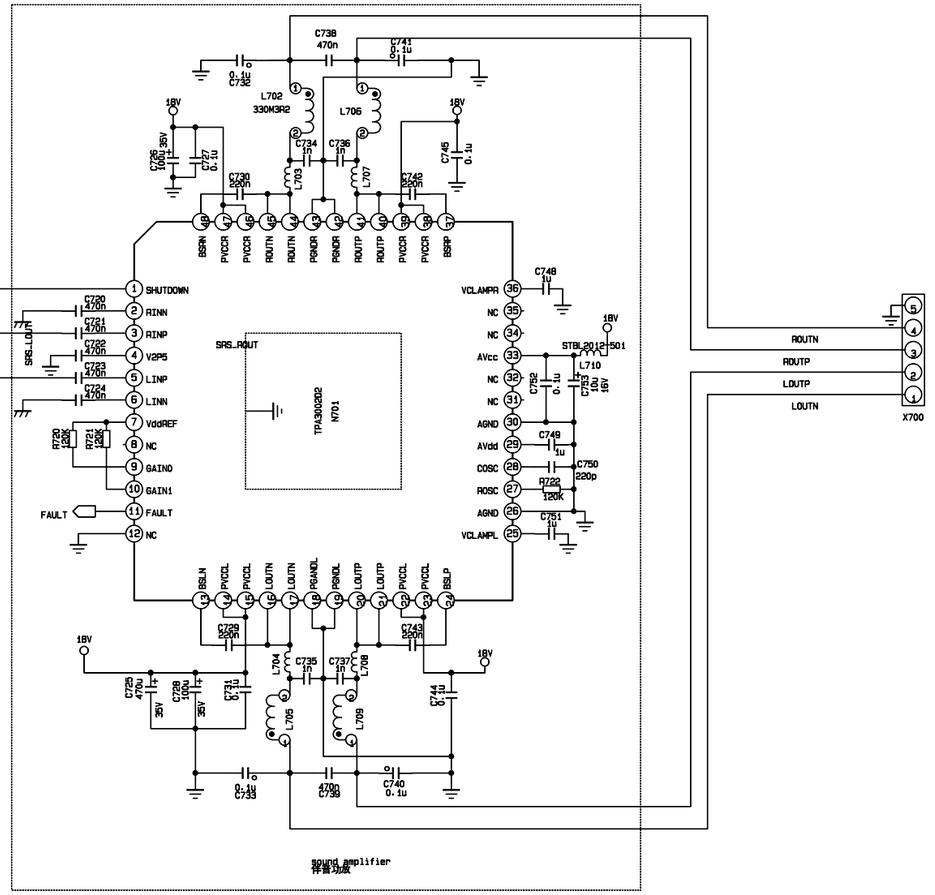
ESD器件更改

Analog board









NOTICE

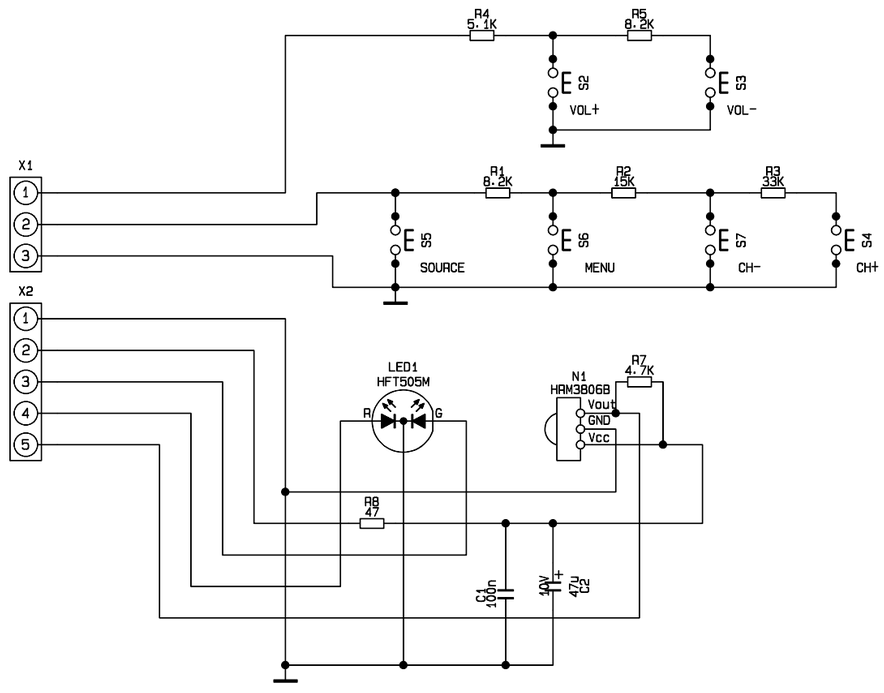
主要更改部分：

电源增加STANDBY开关

伴音功放增加STANDBY开关
及输入增加开机消音

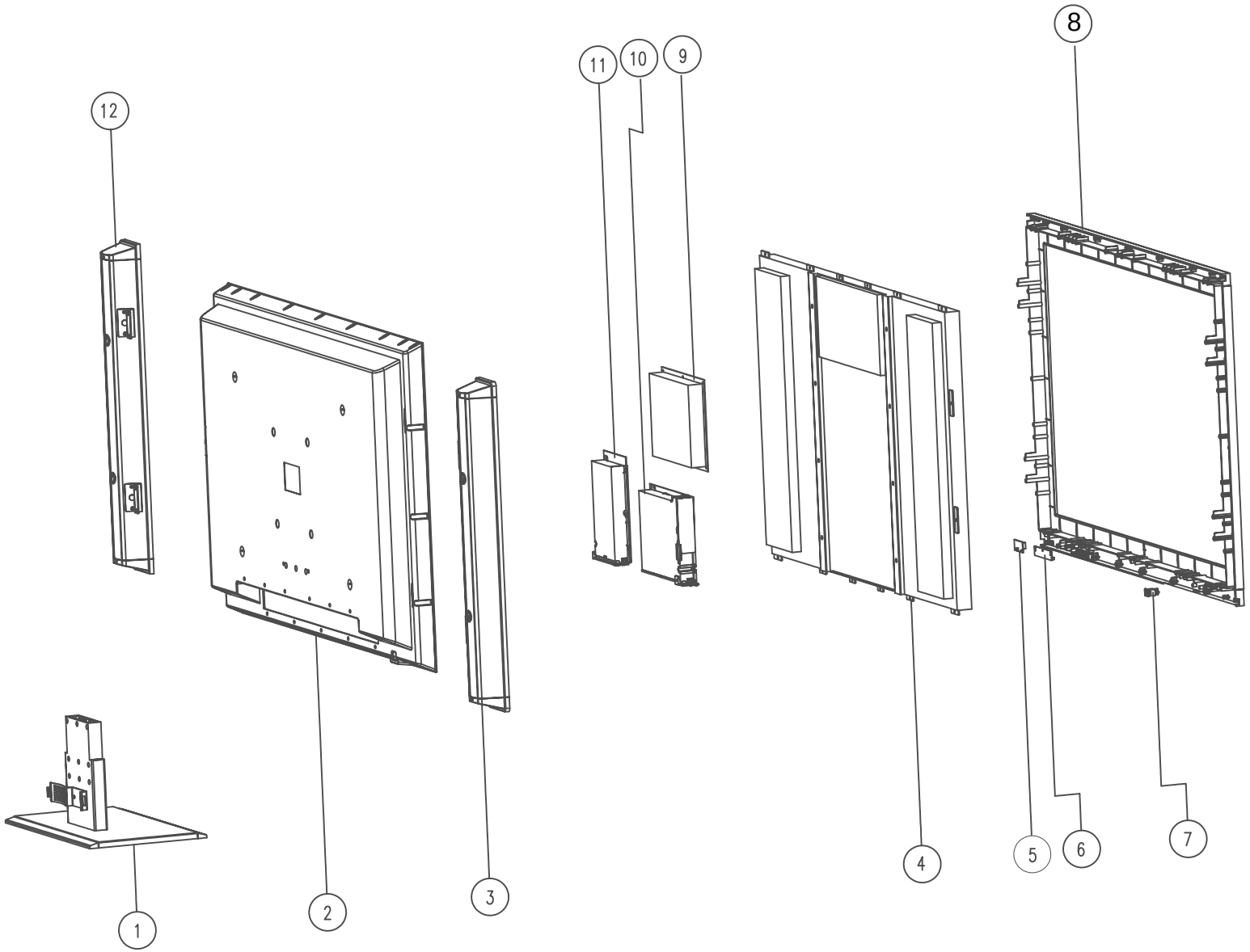
电源增加滤波电感

Analog board



IR receiver board

power board


12
11
10
9
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PART LIST OF EXPLODED VIEW (LCD-47XR2)

NO.	DESCRIPTION
1	Stand
2	Back cabinet
3	Left speaker
4	Screen
5	Infrared receiving board
6	Key board
7	Power switch
8	Front cover
9	Power board
10	Analog board
11	Main board
12	Right speaker
13	User manual
14	Remote Control

PARTS LIST

LCD-47XR2 ver.1.0

REF.No.	PARTS No.	DESCRIPTION	Q'TY	REMARK
1	XI6151071540	Stand	1	
2	XI5HW27RH02A	Back Cabinet	1	
3	XI617057701A	Speaker(Left)	1	CMO V470H1-L03
4	——	Screen	1	
5	XI6LT0020910	Infrared Receiving Board	1	
6	XI6FE0060510	Key Board	1	
7	XI5293000042	Power Switch	1	
8	XI5Q327R003C	Front Cover	1	
9	XI6LT0412010	Power Board	1	
10	XI6LT0075310	Analog Board	1	
11	XI6LT00901C0	Main Board	1	
12	XI617A57701A	Speaker(Right)	1	
13	XI5944016490	User Manual	1	
14	XI6010I00908	Remote Control	1	

* Only the parts in above list are used for repairing.
* Other parts except the above parts can't be supplied.

Mar/2007/30 CPS

SANYO Electric Co., Ltd.